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In This Issue—*Every Person in the Service Station is a Salesman*

MOTOR AGE

Volume XL
Number 13

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CHICAGO, SEPTEMBER 29, 1921

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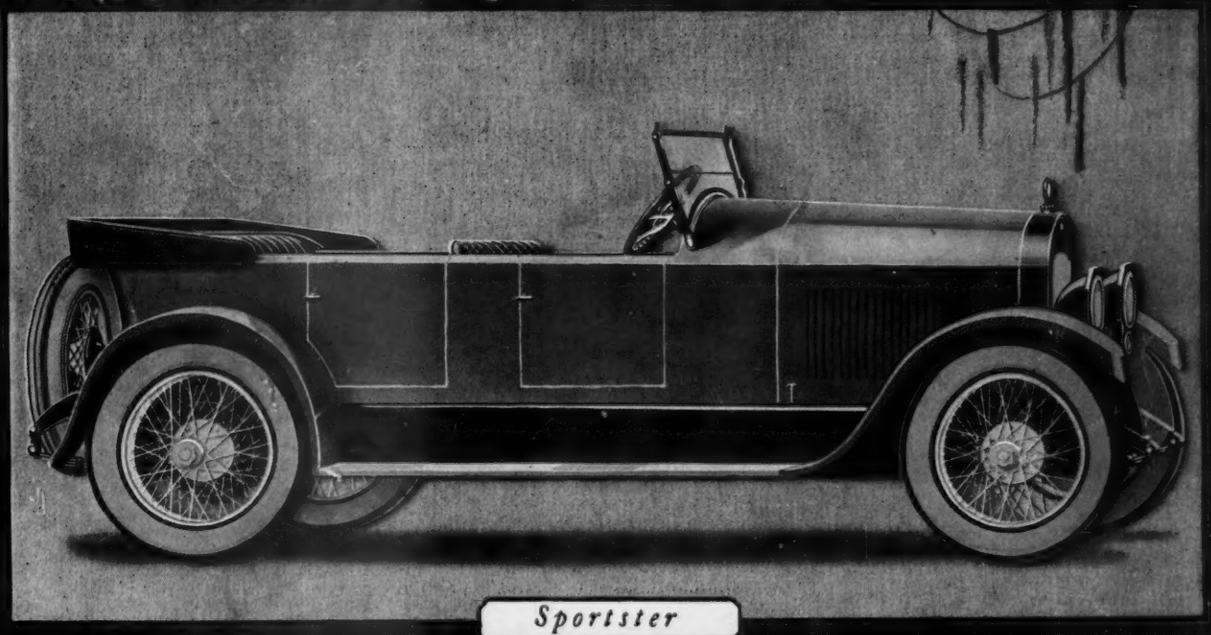

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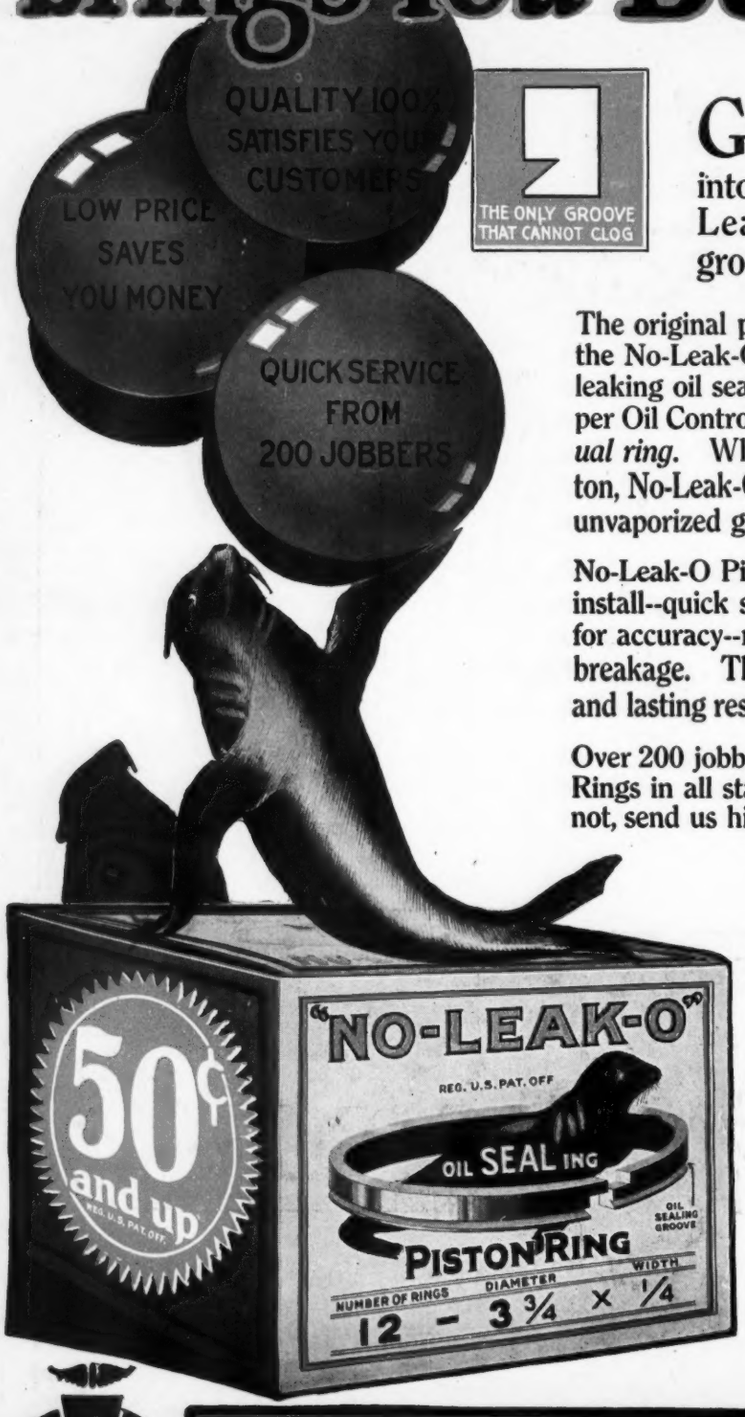

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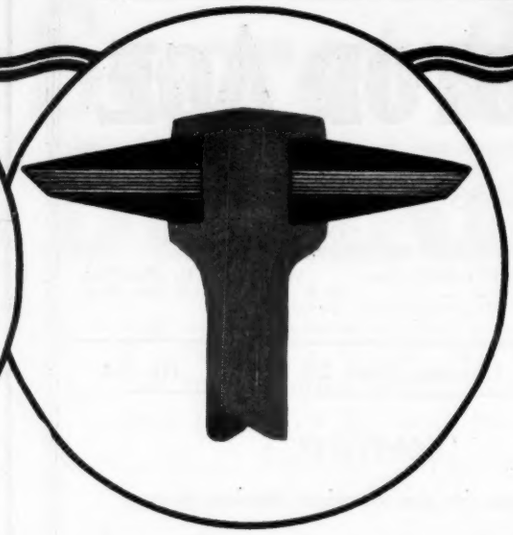

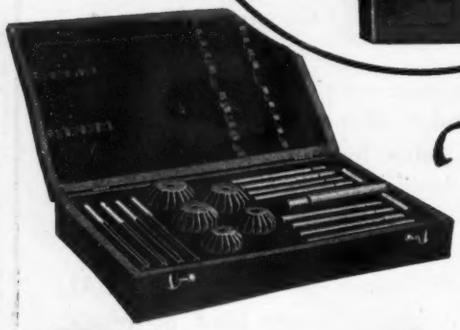

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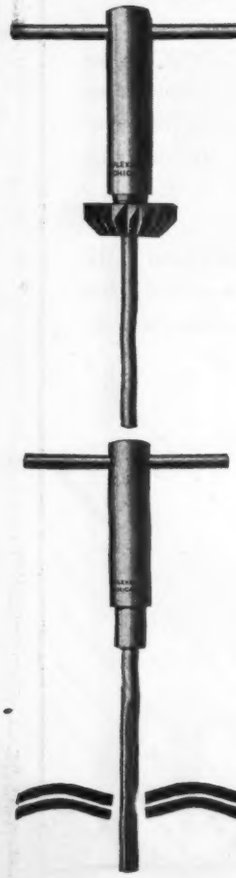

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CHICAGO

VOL. XL, No. 13 CHICAGO, SEPTEMBER 29, 1921 $3.00 Per Year

MOTOR AGE

Mechanic, Telephone Operator, Car Washer or Service Man— All Are Salesmen

TOO many persons engaged in the selling and servicing of automibiles have not as yet realized the fact that everyone in their institution is a salesman or a saleswoman.

Too often the mechanic, for example, is looked upon as merely a man who takes apart engines and transmissions and puts them together again. The thought seldom occurs to many that this same mechanic has the potential power to build up good will for the organization or to build up resistance. Whether it be the former or the latter will depend upon how well or how poorly he does his work.

The same applies to a car washer, the girl at the telephone, the bookkeeper, cashier, parts man or the greasehound. All of these individuals have something more to sell than merely their service to the organization.

Every Person in the Service Station Is a Salesman

Don't Overlook the Important Influence on Customers That Every Employee in Your Organization Exerts, Whether in Direct Contact or Not

By B. M. Ikert

THE mechanic who puts in his eight hours a day in the shop is a salesman.

The man who works in the stockroom is a salesman.

The lowly greasehound who fusses around all day with a bucket of grease, oil cups and dirt is a salesman.

The girl at the telephone who adroitly shifts her gum from one side of her mouth to the other is a salesman.

The car washer who lives most of the time in his hip boots is a salesman.

The service man who listens to the troubles related to him by car owners is a salesman.

The foreman in the shop who supervises and inspects the work turned out by the mechanics is a salesman.

Then there are the new car salesmen and the used car salesmen, who naturally are such because of their particular standing in the institution.

Finally there is the dealer himself who is or should be a salesman.

THE foregoing paragraphs have simply been put forth with the thought of pointing out especially to those in the service end of the industry that every person in a dealer's establishment is a salesman, directly or indirectly.

The nature of some of the work in a service organization is such that the persons associated with that work must come directly in contact with the customer. Thus the dealer himself, particularly in smaller institutions, must deal directly with the customer. So must also the service manager, the service salesman, the parts and accessory man, the cashier and the telephone operator deal more or less directly with the customer.

With some of the others in the institution it is different. Thus, the man in the shop, unless it be a small establishment, will not deal with customers directly. They never see him. The shop foreman, except on certain occasions will not see them. Neither will the greasehound or the car washer.

The work of the latter individuals, while it is of such a nature as to preclude the possibility of direct contact with the customer, is, nevertheless, of great importance, and, when everything has been said and done it is equivalent in a sales way to that of the salesman who sits down in the salesroom with a prospect to sell him a new car.

In a good many service institutions there is a feeling among those in the shop, for instance, that their work is not as important as that of the salesmen who sell cars. Perhaps much of this is due to the fact that the salesmen wear different clothes in carrying out their work from the clothes of the mechanics. Then, too, there is another reason for this feeling and one which is altogether too common in the servicing of automobiles.

It is this. The men in the shop have not much use for those in the sales department and the salesmen look upon the men in the shop as a necessary evil. How often does one hear the expression from a salesman to a customer, "You'll have to excuse our service department, Mr. Jones, but you know it's hard to get good men, etc."

Likewise you hear many a mechanic give vent to his feelings regarding the sales department, as follows, "Those guys in the front office promise these birds (the customers) anything to make a sale and we fellows have to break our necks to make good the promises, etc."

MECHANIC HAS DEFINITE THING TO SELL

FORTUNATELY in some sales and service organizations this feeling does not exist on the part of mechanics and salesmen. There is in some institutions real cooperation as regards these two vital departments of the business. Mechanics in such institutions know that there is a definite relation between their work and that of the men who are trying to sell not only new cars but the institution as a whole.

The mechanics know, for instance, that a slip on their part in a repair operation on a customer's car may mean the nullification of a month's work on the part of a salesman who has been trying to sell that customer a new car.

In the same way the salesman who knows the value of a good service department understands the importance of keeping a customer sold on the institution through efficient service intelligently sold to the customer. The salesman, especially if he has come up through the ranks from a mechanic, knows the problems of the shop and service department and plans his sales talks and dealings with the prospect or old customer accordingly.

We have said that the mechanic who puts in his eight hours a day is a salesman. This may be a surprise to the mechanic and to many dealers too, for that matter. The mechanic is a sales man because he has a definite thing to sell—his immediate tasks and the organization.

In his immediate tasks the mechanic is a salesman because of the way in which he does his work. Suppose he has installed a new ring gear and pinion in a car and has not lined up the gears properly, with the result that they growl a little. "What's the difference," he says, "the fellow that owns this car don't know the difference. If the noise gets too bad he'll come back. And maybe the gears will quiet down after a bit. Anyway, why worry my young life about it. I'm not getting rich in this shop, so why worry." And so he might tackle the next job feeling the same way about it.

Perhaps the customer who owns the car has been sent from the service station assured by someone that new gears always are a little noisy and will get quiet in time. This someone who tells him perhaps does not know that the mechanic has been careless with the installation and has made no attempt to get the gears quiet.

Result: the customer gets mad at the whole institution in a short time because

the gears are more noisy than ever. He was told they would get quiet and instead they got noisier. The mechanic had a chance to sell his work to his man and did not do it. He may not know that this customer is mad and cussing the organization. The dealer who may be trying to sell him a sedan may not know it, but when they see Mr. Customer driving around in some other make of car, they may awaken to the sad truth that something has happened.

But this isn't all that happened. Mr. Customer in his anger went to another shop with his noisy gears and was informed by the service man there that his gears were not properly installed in the first place. Sooner or later this service station finds out who did the work and has the laugh on the other place. It does not take long for this sort of information to get around and soon the first shop gets a black eye—just because the mechanic did not realize his position as a salesman. **Maybe he was never informed by those at the head of the institution that he was a salesman.**

GREASEHOUND MUST KNOW SALES ETHICS

LET us take another case—this time the man who looks after the greasing and oiling of the cars that come into the service station. He is the greasehound. Not the most desirable kind of work, to be sure, but important work just the same. He does not work in the salesroom, where the floors are white tile and woodwork mahogany. He is tucked away, out of sight, where the floor is cement and the woodwork pine. He is not noticed very much, nor does he bother about such things as sales ethics or house policy. He knows what kind and how much lubricant to put in the differential, where this and that oil cup is located, and so on. **Yet he is a salesman.**

Suppose one of the company's best customers brings in his car for an inspection and lubrication of the chassis because he wants to make a fast trip of several hundred miles and wants the car in good shape for it. Suppose the greasehound in his work discovers that the differential housing is leaky and says nothing about it. The customer takes the car out on the trip and drives pretty hard, straining the various units and calling for good lubrication of those units. Suppose most of the lubricant in the axle has worked out, and after several hundred miles he has axle trouble caused by insufficient lubrication. Result: he is going to be mad because he immediately will blame it on the organization which worked upon his car. If the lubricant has worked out—why? Why didn't they catch the trouble in the service station? He paid good money for the inspection and lubrication, and look at the result! He, too, is going to be mad at the organization.

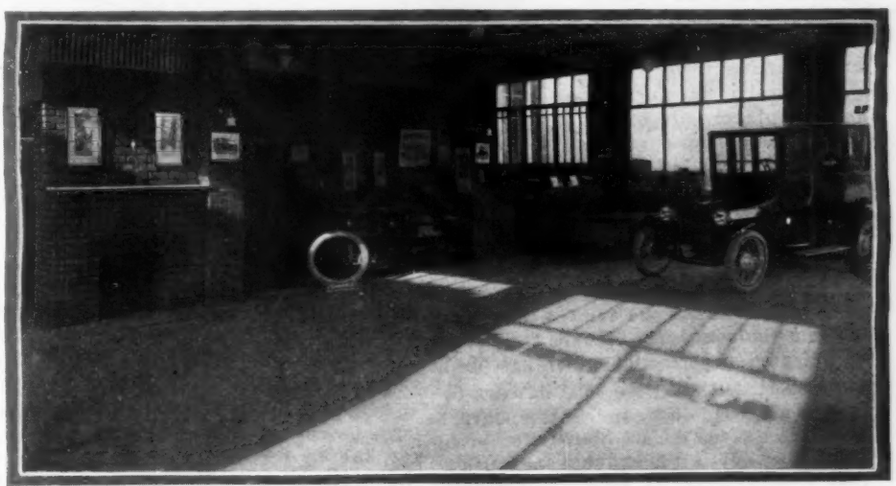
Now suppose, the greasehound had carried out his obligations as a salesman and done this: upon looking over the axle and discovering the leakage at the joint and at the brakes, he notified the service manager who in turn notified the customer, and got his O. K. on the operation of making the housing tight. Then the greasehound made sure every oil cup, spring shackle, drag link, etc., was lubricated. He made sure also that any gobs of grease or any drops of oil were wiped from the car, so that when the customer called for it it was spotlessly clean.

The customer will be told by the service manager that his car is ready and advised again of the necessity for having the shop tighten the rear axle housing. The customer is assured of the service station's desire to have his car in perfect shape for the trip—all of which makes a hit with him. And, the greasehound has done his duty as a salesman. He sold himself and the institution. The easiest way for him to have done would have been simply to wipe the excess lubrication from the housing, put more in the case and let it go at that. But he knew that trouble might follow and it would not do for the house to displease this customer.

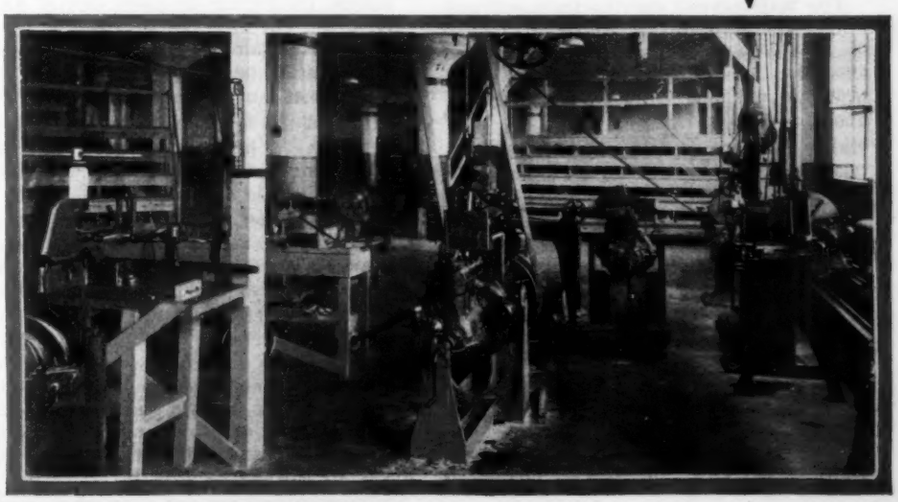
It is possible to go through the whole organization as we have done with the mechanic and the greasehound and show they are salesmen or saleswomen. We have repeatedly pointed out in these columns that all the efforts of the dealer or one of his car salesman can be torn to shreds by an unkind remark from a clerk over the telephone or by an uncouth action in the service department.

We know of an organization that employs a girl as telephone operator and information clerk who is one of the greatest assets to the company because of her manner of operation. She is one of the best salesmen for the company and yet there is not a cent's worth of tangible matter passing through her hands. People like to hear her voice over the phone **and they judge the whole institution by her.** If she were unpleasant and snapped out information and banged down the receiver, there is only one guess as to the result.

And so, the girl in the office of a dealer's establishment, the bookkeeper, the stenographer who is on the lookout for ways in which she can better the functioning of this or that department, the cashier, who collects from the customer and "hopes he is enjoying his car"—all are salesmen of the utmost importance. It helps to sell service with a smile.



Usually We Think of the Salesroom As in the Front of the Building, But—There Is Just As Much of a Salesroom in the Repairshop at Rear



Goux Breaks World's Road Race Record in Italian Grand Prix

Averages Over 90 M. P. H. for 324 Miles on Ten-Mile Macadam Course—Records Also Established in Event for Cars of 91.5 Cu. In. Displacement

By W. F. Bradley
European Correspondent for MOTOR AGE.

WORLD'S automobile speed records were broken on the Brescia, Italy, road course Sept. 5, when Jules Goux drove an eight-cylinder, 183 cu. in. Ballot 324 miles in 3:35:9, an average of 90.4 m.p.h. Three days later Ernest Friderich drove a four-cylinder Bugatti, having a piston displacement of only 91.5 cu. in. on the same course in 2:59:18, an average of 72 m.p.h.

The high speeds attained in this record race, the small amount of mechanical trouble, the economy in tires, (which gave such good service that they did not influence the result) and the high degree of perfection which has been attained in getting these 1100 lb. cars to hold to the road—all confirm the conviction that the 183 cu. in. limit is too high for racing. It is the opinion in Europe that these two Italian races have shown that 183 cu. in. cars next year will be capable on this course of an average of 95 m.p.h. At these speeds tires are stressed to their utmost limits and are liable to falsify the results of the race, while the cars are really too fast for even the best drivers.

The major event was the Italian Grand Prix, organized by the Automobile Club of Milan on a specially prepared road course a little more than 10½ miles. In order to avoid a village and a stream, about two miles of road had been specially built by the club, thus making a triangular course with not a single house along its course, but around which numerous grandstands have been erected. The oil macadam road stood up perfectly during the practice period and the race. It is intended to get government permission to have exclusive use of these roads two or three days a month for practice or experimental work.

Not only was this race the fastest ever run in Europe, but it broke the record established by Pullen in a Mercer at Santa Monica in 1914, the American car averaging 84 m.p.h., compared with more than 90 by the winning French car. Although the distance is not the same, the Indianapolis 3-litre record rate of speed was beaten, and even the Indianapolis 300 cu. in. record was defeated by a narrow margin.

Jules Goux, winner of the 324-mile road race at Brescia, Italy, traveled the distance at 90.4 m.p.h., breaking the record. One of the 183 cu. in. Ballots in this race is shown here

DE PALMA DROPS OUT IN 22ND LAP

The King of Italy was an interested spectator at the race which Goux won. Jean Chassagne was second in a Ballot at an average of 88.4 miles, and Louis Wagner third on an eight-cylinder Fiat at 86.1 miles.

Ralph De Palma dropped out of the race after covering 22 of the 30 laps, Sivocci in a Fiat was forced out with a broken water connection, and Bordino in a Fiat went out at half distance after having led the field up to this point and establishing a lap record at 93.94 miles and a record of 92.3 m.p.h. for the first 140 miles of the race.

The race was contested by only two teams: three French Ballots an dthree Italian Fiats. While the automobile race was in progress an airplane race was run for a shorter distance over practically the same course. Despite the small number of cars, record crowds, estimated at 90,000 persons, lined the course, for it was known that the two teams represented the cream of European production, and it was expected that they would lower all world's records.

Louis Wagner started first in his Fiat, followed by De Palma in his Ballot, at an interval of one minute. Then came Bordino, Fiat; Chassagne, Ballot; Sivocci, Fiat, and Goux, Ballot.

Wagner drew away from De Palma on the first lap, but the fastest time was made by Bordino, who covered the 10.8 miles in 7:20. Wagner was second, Chassagne third, Goux fourth, De Palma fifth and Sivocci last. This driver missed one of the turns and went into the sand bank thus losing five minutes and breaking a water pipe which ultimately caused his retirement at three-quarter distance.

Bordino, who recently left the Lancia company, where he was chief tester, to join the Fiat racing team easily led the field for the first 13 laps. All these laps were covered at equal to 93 m.p.h. and the record was established for one lap of 93.94 m.p.h. When he stopped at the end of the thirteenth, on account of a punctured tire, he had averaged 92.3 m.p.h., which is the highest speed ever attained on the road for this distance. At the end of the fourteenth he had to stop for a burst tire. These changes pulled him down and at the end of the fifteenth, or half distance, he was second to Goux's Ballot and only one second ahead of Chassagne. On the sixteenth lap he dropped out with a broken oil connection.

Louis Wagner, after holding second place for the first three laps, had to pull in for a tire punctured by a nail. A lap later a leaky valve caused him to make another change. In quick succession three left rear tires were changed, and although this dropped him down seven minutes behind the leader at half distance, Wagner was so smart in his wheel changes and his car showed such a turn of speed that he gradually improved his standing.

It was found that three of the tires changed by Wagner were neither punctured nor burst, and for a time feeling ran high against him, the Italians de-

claring that he, as a foreigner, was throwing the race away. Wagner's explanation is that his mechanician signalled three times that the left rear was flat and the change was made. The mechanician insisted that these tires showed flat on the turns while the Pirelli staff maintains that they had their normal pressure when taken off. Two more changes had to be made by Wagner, one of these being for a burst, and the other a tire which had lost all its rubber tread.

The curious feature of this situation is that Ballot and Fiat used the same tires—the new Pirelli straight side cord, and while the three Ballot cars went through without a change, Wagner probably lost the race because of his tires.

All cars in this race used the new Pirelli straight side cord tire of 33 by 5. De Palma started out without a spare but the others carried one wheel at the rear. The big straight sides making the cars rather heavy to steer, Goux decided to used Pirelli clincher bead 32.6 by 4.2 in. tires on the front, these being of fabric construction. Wagner tried this combination in practice, but after he had lost a tire off the rim at more than 100 m.p.h., he considered it unsafe. Evidently Chassagne and De Palma were of the same opinion, for they adhered to straight sides all round.

STRAIGHT SIDE CORD TIRE STANDS TEST WELL

The service given by Pirellis on the Ballot cars was excellent, the two leading cars finishing with their tires in conditon to run doubtless another couple of hundred miles.

It has been claimed that the reason the same service was not obtained on the Fiats was on account of the higher center of gravity. This is denied by the Fiat engineers, who claim that the difference in this respect is not more than an inch. The Ballot frames are 14¼ ins. from the ground and the Fiats 15 7/16.

The winning Ballot cars are the machines which were in the French Grand Prix at Le Mans. De Palma had the car which he drove at Indianapolis. The Fiats, which made their first appearance in a road race, were entirely new, with eight steel cylinders in line of 2.6 by 4.5 in. bore and stroke. A sheet steel water-jacket surrounds a group of four cylinders. There two valves inclined in the head, the spark plug is in the center, and two separate camshafts are used, the drive being at the rear, by means of a vertical shaft. Through bevel gearing, this shaft also drives two four-cylinder magnetos.

One of the features of this engine is the extensive use of roller bearings, the crankshaft being carried in ten bearings of this type. Roller bearings are also used for the connecting rod ends and for the valve operating gear. Lubrication is under pressure with a dry sump. The engine is mounted directly in the frame by four points and has the gearbox housing bolted up to its rear. Water is circulated by means of a pump and a draught of cold air is directed through the crankcase. Maximum power is developed at about 4300 revolutions, when it is believed that the engine gives off about 112 hp. No authentic information has been given out on this point, but it is known that the engine will run under load up to 4600 revolutions.

Both drive and torque are taken through the springs, which are underslung semi-elliptics. Final gear ratio used in the race was 14-52, compared with 14-45 for the Ballots, both with 33 by 5 in. tires. Brakes are applied simultaneously on all four wheels, the drums in front being rather smaller than those on the rear. Fabric lining is used in front and cast iron at the rear.

HOW THEY FINISHED AND THE TIME FOR THE 324 MILE ROAD RACE—183 CU. I N. CLASS

Position.	Driver.	Car.	1st lap.	10th lap.	20th lap.	Final.
1	Goux,	Ballot	7.37	1.11.43	2.22.32	3.13.12
2	Chassagne,	Ballot	7.30	1.12.23	2.24.32	3.16.48
3	Wagner,	Fiat	7.27	1.18.52	2.30.27	3.23.55
4	De Palma,	Ballot	7.40	1.16.45	2.29.03	Out 21st
5	Sivocci,	Fiat	12.39	1.17.34	Out 18th	
6	Bordino,	Fiat	7.20	1.10.11	Out 18th	

Small Cars Break a World's Record

UNEXPECTEDLY high speed averages featured the second race. Friderich's average of 72 m.p.h. constitutes a world's record for cars of this size and is a higher speed than was attainable in 1914 with engines of twice this piston displacement.

In addtion to winning the race, the French Bugattis also captured the three following positions:

Viscaya second at an average of 71.3 miles

Baccoli third at 69 miles

Marcot fourth at 68 miles.

The first Italian to finish was Minoia on an O.M., produced in Milan, who averaged 67 m.p.h.

Friderich, the winner of the race, won last year's French Grand Prix for cars of 91.5 cu. in., and was a starter in the 1914 Indianapolis race on a Bugatti.

The race, which was run on a fast, level, triangular course about eight miles to the east of the city of Brescia, united 13 competitors, the teams, being in addition to the French Gugattis, three Italian Chiribiris, four Italian O. M., one Silvani, and one Restelli, both Italian.

The cars were closely bunched throughout the race; there was very little mechanical trouble, only two tires changes, and all the small machines held to the road at 80 m.p.h. as well as big racing cars.

The French machines proved themselves faster than the Italian with the exception of the Silvani. At about half distance this car got into the lead with a small margin but with just sufficient to secure the victory if there was no mishap. At about three quarter distance the Silvani bearings failed and the Bugattis had the race well in hand. It was not until the last lap that the winner, Friderich, got definitely into the lead. For a long time he had run a very close second to Viscaya, but having blown a tire in an attempt to avoid another car on a turn, he dropped to fifth place for a short time. He got back to second place, and on the final lap shot into first position.

The Bugatti cars, which weigh 1100 lbs., have a four-cylinder motor of 2.7 by 4 in. bore and stroke, with four volves in the head operated by an overhead camshaft, with vertical bevel gear drive. The crankshaft is carried in three ball bearings, and roller bearings are used for the connecting rod ends. Ignition is by a couple of high tension Bosch magnetos carried on the aluminum dash and driven from the overhead camshaft by a horizontal shaft with a couple of flexible fabric couplings.

The Bugatti cars are stock machines with the exception of the roller bearings for the connecting rods, which were used as an experiment, and the two magnetos. The gearbox is separate from the engine and provides four combinations ahead. Springing is by inverted quarter elliptics. The cars are equipped with wire wheels and cylinder bead Michelin fabric tires of 28.4 by 3.6 in.

The Chiribiris ran three quarter distance, when they were put out with minor mechanical troubles. These cars are modified stock jobs, the engine being a four-cylinder overhead valve type, with cylinders and crankcase in one casting, measuring 3 by 3.4 in. bore and stroke.

Results:

Position.	Driver.	Car.	Time.	M.P.H.
1	Friderich,	Bugatti	2.59.18	72
2	Viscaya,	Bugatti	3.0.35	71.3
3	Baccoli,	Bugatti	3.06.47	69
4	Marcot,	Bugatti	3.08.42	68
5	Minoia,	O.M.	3.13.50	67
6	Coffani,	O.M.	3.14.28	
7	Iliprani,	O.M.	3.29.29	

The Cry for Smaller Racing Cars

THE 183 cu. in. limit is proving too high for racing purposes. The average for 324 miles over the course at Bresica, Italy, Sept. 5, was 90 m.p.h., and 95 m.p.h. is predicted for next year's race, if cars of this displacement are used.

The Indianapolis race for 1923 will be limited to cars of 122 cu. in. This is the fifth time that Indianapolis has reduced engine sizes. The development of 122 cu. in. cars showing high efficiency would be a valuable contribution to motor car engineering. Louis Chevrolet, veteran race car designer, states it will be possible to build a 122 cu. in. car to average 90 m.p.h. This car would weigh about 1700 lb. and be relatively easy on tires.

Don't Try to Do Too Much Yourself

Proper Organization Will Release Dealer from Details. Impossible to Work On a Car and Direct Major Activities of Organization at Same Time

IN the merchandising of their sales and service many dealers are trying to do too many things.

Too many dealers have crowded detail into their work, leaving no room for the more constructive undertakings.

There are too many who still adhere to old time business methods and think they have to have a hand in every move or the ship will go on the rocks.

The reason bank presidents and the heads of railroads are successful in their enterprises is because they found out long ago that to achieve the desired end they must divorce themselves totally from details and entrust these to other individuals in whom they have confidence.

Some dealers are not executives. Many have come up through the ranks as mechanics and cannot adapt themselves to the new conditions. They do not think in broader terms. They struggle with details and fear that things will not be done unless they do them.

Some dealers are so absorbed in fighting with details that they fail to give thought to more important matters

In many small towns the dealers who have started up in business for themselves were at one time employed as mechanics, service men or something else and still think in the terms of such capacities. Thus, you will often find the dealer lying under a car dismantling a universal joint when he ought to be busy in the office trying to sell the institution as a whole.

He has the idea that this particular customer must be treated just so. His car must be right and he, the dealer, is the man to fix it. He does not trust a mechanic. He may remember how important certain operations were when he worked as a mechanic but does not realize that other mechanics, many probably better than he, know the same thing and can do it as well or better.

Take a man starting up in business for himself. He may undertake an humble business like a popcorn stand. In time he adds a few extra lines like chewing gum, peanuts, etc. He looks after everything from operating the small steam engine that runs the machinery to the ringing up of the sales in the cash register. The business essentially is a one-man institution and as such the peanut and popcorn vender can get by with a certain degree of success.

EXECUTIVES SHOULD NOT BE SLAVES TO DETAILS

NOW, as has been often the case, this peanut and popcorn vender branches out and establishes a store. He adds candy to his line and puts in a soda fountain. He finds it necessary at this point to put more people into his institution. He needs a man for the fountain. He probably needs a girl to act as cashier. He may need one more clerk to help in making sales. With the organization functioning properly he feels he can leave the business for any length of time and be assured that everything will be well. He has confidence in his help. He has trained them and placed them in positions of responsibility. They can look after details as well as he can.

There are too many automobile dealers who are slaves to details. You will find them worrying around with small repair jobs that a fourteen year old boy can do, when they should be giving thought to more constructive things, such as better arrangement of the machinery in the shop to speed up certain lines of work; the reduction of overhead through elimination of waste; better spirit of cooperation between the departments, getting the good will of the people, etc.

It is seldom the case that you find the manager of a department store behind the counter selling goods. Yet one can go into many a service station and find the head of the institution under a car covered from head to foot with dirt and grease. This is not the manager's job. He does not belong there any more than the dry goods store manager belongs behind the ribbon counter.

Many of the failures in the automobile business during the last year have been due to the fact that dealers got so deeply buried in details that they could not see which way the business in general was going until too late.

Some of the most successful automobile businesses are those where the man at the helm has given responsibilities to employees. A shop foreman, a parts manager, accountant or anyone else is going to give much better satisfaction when intrusted with certain responsibilities. Employees like to feel that they are responsible for things and that they are not checked up on every little detail because the head of the institution feels he must have a finger in the pie, or it will not come out well. Take responsibility from a man and he ceases to be of any material value to a concern. On the other hand, let him know his part in the business and watch him make good.

The dealer who tries to do too much himself has not the time or opportunity to study the broader aspects of the service problem. The less he has to do with detail, the better able he is to give

thought to those subtle things which distinguish a good from a bad business. The less he fusses with little repair jobs the better able he is to give thought to the welfare of his men in the shop.

He will be able to promote such activities as semi-monthly or monthly meetings of the people in the organization for the discussion of common problems. Other lines of business have found such meetings profitable and many automobile establishments have followed the plan with success.

We have all heard of the "one-man" institution, wherein if the particular man in question is not there the whole organization is upset. This is fundamentally wrong. Organization means that any unit of it can be affected without materially affecting the whole. This end is obtained in many organizations by the correct distribution of activities and by the fact that the men and women in the organization know exactly where they fit in the picture. A dealer's organization is not the best when he says to a customer, "I'll look after that job in the shop myself." The organization ought to look after that. If it is right he should be able to say, "Our shop will take care of it" and the job should be ordinary routine.

ENCOURAGING THE EMPLOYEE TO GIVE HIS OPINION

Of course, the owners of small automobile sales and service businesses cannot afford to keep on hand a staff of people for the conduct of the business, as is possible in the larger institutions. In the larger institutions it may be customary for the heads of the different departments to meet every month and take up the major problems of the departments and the business as a whole. There is nothing to prevent the dealer who runs a smaller business from carrying out the same idea. He may have fewer employees and many of these may have to fill several jobs, but there is no reason why they cannot be brought together for a discussion of the business. Conferences with employees soon reveal the fact that the employees have excellent ideas and often are capable of handling certain divisions of the business as well or better than the dealer.

Thus, the shop foreman might go on forever as such if nothing is said or done to change his standing. But if he is given a chance to express his mind at a conference of employees, it may be sooner or later developed that the business would prosper more if he were to turn the shop activities over to another mechanic and assume the duties of service manager. The dealer might see in him just the man he wants to build up the service end of his business. But for the joint meeting of dealer and employees such a man might go on unnoticed forever.

The dealer who has rid himself of detail is in a better position to study the future of the business. He is in better position to study economic conditions, the farmer's attitude and banking situations.

Flat-Rate—Courtesy—Follow-Up—By a Service Manager

A SATISFIED OWNER, the service manager must always remember, is the best salesman of his house.

During the past four years we have used the estimate system of repairs and have attained more satisfied owners through this one source than any other. This method is a satisfaction both to the owner and the dealer. When a car is left for a specified list of work to be performed and the owner is submitted an estimate and told what his bill will be, something has been accomplished.

The next means of securing satisfaction to all concerned is to see that all items as ordered are properly done. This demands careful inspection. Here, too, is another part that the average service station manager does not give enough consideration. The operation of a large service station where routine and system is carried out, is very different from that of the small garage where the same man writes an order, does the work, inspects and road-tests the car and makes delivery, as it necessitates the enforcement of a careful system of checking up on operation to insure proper car delivery.

Courtesy covers a "multitude of sins" in the operation of service stations and works hand in hand with service. Many a disgruntled owner who has been towed in or has had troubles—possibly his own fault—can be made an enemy, if not handled properly. **One short, curt word may set off the "fireworks," and employees cannot be cautioned and drilled too strongly as to how to handle owners. It costs nothing to be courteous regardless of conditions, and an employee should not be tolerated one minute that would not give each and every owner a smile and greeting.**

After a sale is made—if the owner is sold properly without wild promises and

OPINIONS OF R. E. STARKEY

Service Manager, Willys-Overland Pacific Co., Seattle, Wash.

claims as to what the service policy of his particular car is—the question of service is simple, and it is not hard to satisfy the owner. But if he is laboring under false statements, should his new car need repairs and should he be presented an invoice covering labor charges only, in accordance with the standard warranty, he right then and there says, as I have heard many owners say: "They are sticking me, and not living up to promises made." If he is not corrected in time he can do the service station a lot of harm of which it is innocent.

I, personally, meet every new owner, and when he takes delivery of his car, introduce him to the service men on the floor so he will feel at home. I explain a few mechanical details—"do's and don'ts"—also the service policy, as outlined, and I have with only few exceptions, been able to keep them as satisfied owners and boosters.

During the war it was impossible to get efficient mechanics who could be depended upon, but now we can get **mechanics that are steady and first-class in every respect. I have always found that an entire force of competent men is far better than a few of them with helpers or apprentices. When using the estimate rate on repairs it is essential to have the best mechanics, in order to turn out good work in a given period of time, and eliminate come-backs.**

The question of follow-up is an important one and has not only brought in repair work but has brought the owner closer to the organization. He is usually pleased to think that the service station is interested enough to call or 'phone him after repair work has been completed to find out whether everything has met with his entire approval.

We make it a practice to communicate with our owners at least once every month to determine whether their car is operating properly; also to find out if any work performed is not right. I do not believe in sending out cards after each repair job, requesting information as to whether or not it was satisfactory. In most cases the owner, if satisfied, will shelve the card and promise himself that he will fill it out and send it in at some future date—but it is forgotten and the dealer does not get the results **that a 'phone or personal call brings.**

The question of service has settled down to a hard and fast basis with fundamentals and principles to follow out.

DEALERS TO GET CHICKEN

Indianapolis, Sept. 24—Plans for a general "get-together" meeting of automobile dealers of Richmond, Ind., and their employes are being perfected by the Wayne County Automotive Dealers' Assn. The next meeting will be held at Whitewater, where a chicken dinner will be served the members by the Ladies' Aid Society of the church. Harry Chenoweth, Paul James and Walter Timmerman are members of the entertainment committee.

WILLS HAS NARROW ESCAPE

Marysville, Mich., Sept. 24—Harold Wills, automobile manufacturer, and a number of the crew of his yacht, Harold II, had a narrow escape from death Sept. 21, when the craft, upon which they were sleeping, burned. The yacht was valued at $125,000.

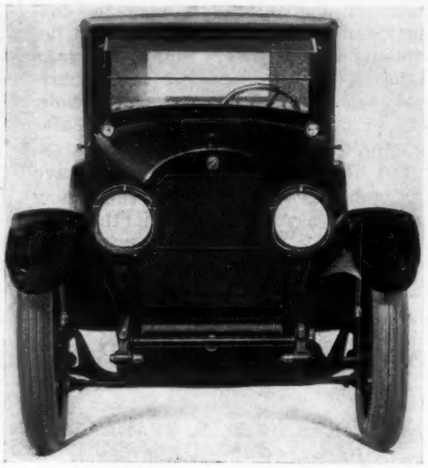
Cadillac Announces New Type 61 Chassis and Bodies

Car Has Lower Appearance Than Former Models. Chassis Has Refinements Making for Easier Maintenance. Only One Size Chassis Now Made

WHILE the design of the new Cadillac type 61 remains basically the same, there are certain new refinements of detail which make the car more pleasing in appearance, better performing and in several instances more durable. There are maintenance features to appeal alike to car owner and service station operators.

In redesigning the rear axle, for example, longer life and reduction in maintenance cost has been secured by enlarging greatly the bearing surfaces for the torque arm pin.

This and the decrease in the size of the ring gear, permitting of a smaller rear axle housing, are the main changes in the axle. The general type of the axle is the same as in previous Cadillacs, the bearing mountings being Timken throughout, with a bearing both on the outer and inner ends of the pinion shaft. There are three sets of gear ratios provided, these being 4-10/11, 4-1/2 and 4-2/13 to 1.



Front end view of the Cadillac model 61 showing the new radiator and hood lines and the new design head and side lamps

The engine changes are of a highly detailed nature, the only internal alteration being in the oiling system. The oil is now led through the hollow camshaft instead of being forced through an independent copper lead for camshaft lubrication. Sub-leads were formerly brought from this main lead to the camshaft bearings. In place of these, holes are now drilled in the camshaft at the camshaft bearing points, lubricating these positively from within the shaft and permitting the bearing to be oiled with centrifugal force instead of against it. The front end driving chains and the air pump in the gasoline system are oiled from the camshaft. This eliminates the leads and has the advantage of simplicity.

Another change in the engine, as far as convenience and accessibility is concerned, is in the arrangement of the water drain valves. It is now possible by means of an ordinary screwdriver to operate the drain valves on the bottom of the water pump from a position above the frame. An indicator dial showing the position of the valve, is now in plain sight. The dial reads in three positions—fill, close and drain.

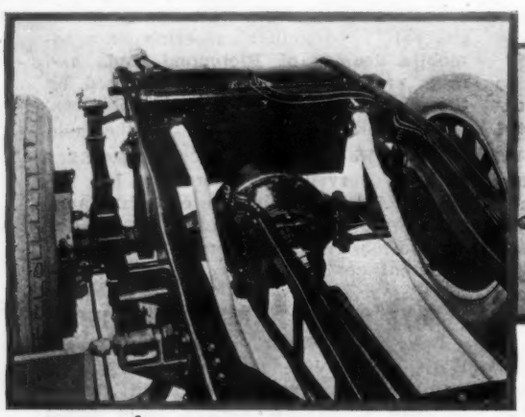
The circulation to each cylinder block is independent of the water circulation in the other, as there are two separate and independent pumps, and there has been an improvement in the thermostat arrangement. Instead of the valves being mounted directly on the sylphon thermostat, as formerly, there is now a connection with a sort of universal action, so that any warping of the sylphon cannot cock the valve on its seat.

The housings containing the sylphon thermostat and the valve are located on the cover of each water pump.

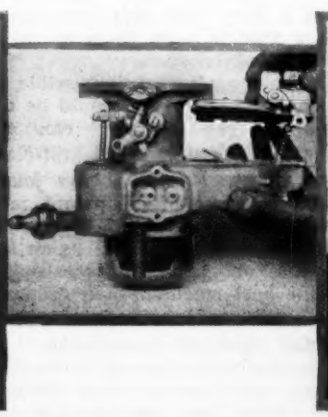
It is necessary, in draining the water system, to force the valves operated by the thermostat from their seats. This is taken care of by the shaft operated by the screwdriver in draining the system, and when the dial is in the drain position the drain port is not only open at the bottom for the water to flow out, but the thermostatic valve is also lifted from its seat. The condenser to prevent loss of anti-freeze solution by evaporation, is still employed.

Changes in the carbureter which now has a 2-in. intake, include the use of thermostatic control for the tension on the auxiliary air valve spring and also thermostatic control for regulating the effectiveness of the accelerating power, a feature of the Cadillac carbureter.

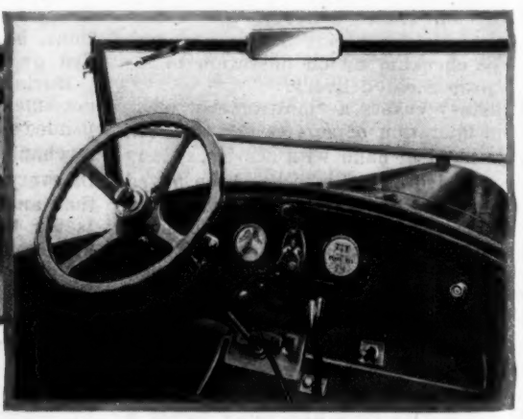
In the sectional view of the carbureter shown herewith, it will be noticed that the manual setting for the air valve is continued, but super-imposed on this is a thermostat which alters the tension on the air valve spring in accordance with temperature requirements. On a cold engine the spring tension is increased, thereby adding increased resistance to the opening of the auxiliary air valves; in warmer weather, the reverse condition holds true, thus tending to pro-



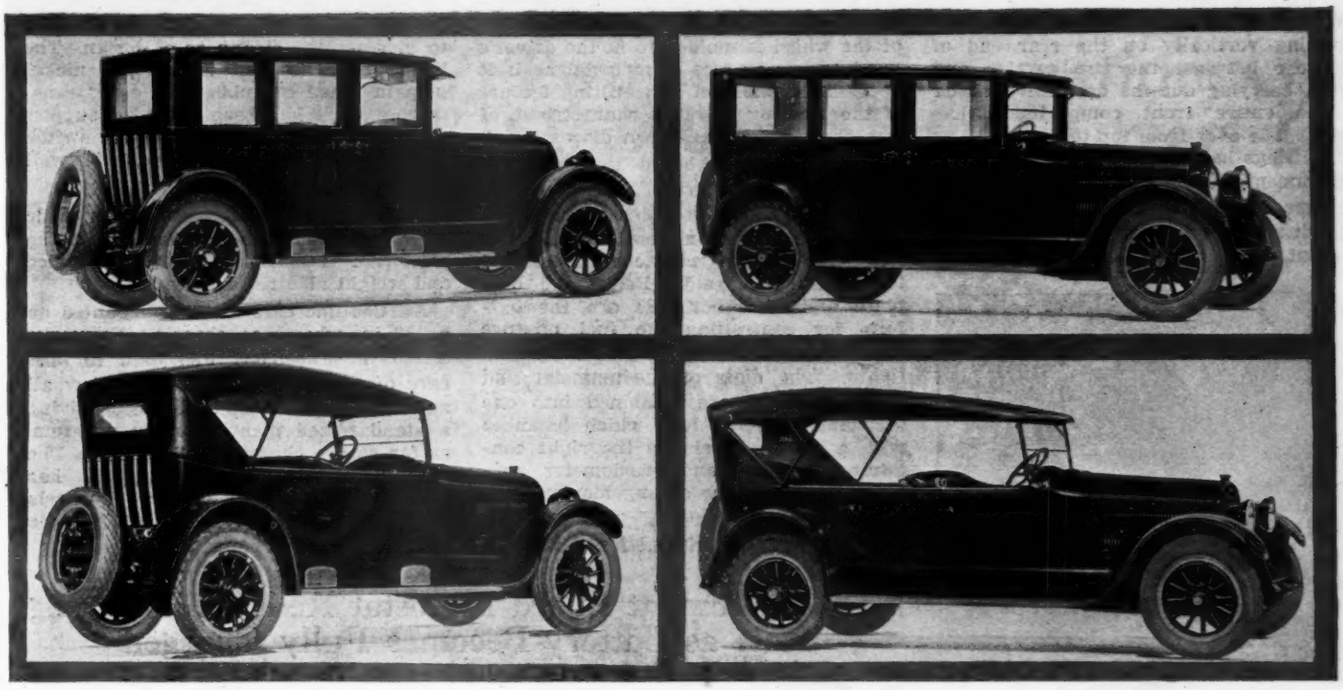
Rear axle housing, showing the greatly increased bearing surfaces of the torque arm pin



New carbureter, showing methods of removing cover plate from flapper valve



Balanced layout of instrument, all-walnut wheel and simplified spark and throttle control



Body styles of new Cadillac type 61. Top, left—Five-passenger sedan with aluminum trunk rack. Right—Seven-passenger suburban. Lower left—Four-passenger phaeton. Right—Seven-passenger touring model. The 33 by 5 in. tires help give the car a low appearance

vide a leaner mixture for warmer atmospheric conditions.

The thermostat on the accelerator pump, which is located in the fuel chamber, operates a shutter which covers and uncovers a vent, thus increasing the effectiveness of the pump when the engine is cold, and decreasing it when the engine is warm. The object of this acceleration or throttle pump is to force gasoline through the spray nozzle when the throttle is opened quickly for acceleration. When the throttle is opened slowly, the pump has practically no effect on the gasoline. The throttle pump is inter-connected with the throttle and its function is to force compressed air into the float bowl. When the thermostat comes into effect and opens the vent, the pump operation is materially reduced. It is claimed that these changes reduce the warming up period materially.

In the electrical equipment of the car, there have been some minor changes. A new generator of the two-pole instead of the four-pole type is utilized. Tilting headlights are continued, but have been materially changed in design for durability and simplicity. The headlights are now mounted on a tubular crossmember which crosses the entire front end of the car at about the center of height of the radiator. The headlamps are mounted on posts which permit of individual adjustment of the position of each lamp.

The tilting mechanism for the reflector has been improved so that wear in the operating linkage does not affect the uniformity of tilt in the reflectors. By so arranging the tilting mechanism that it swings over a center to a uniform degree, the tilt in the headlights is rendered independent of wear in the operating mechanism.

Improved chassis lubrication has been secured by the use of better grease cups where they are necessary and the elimination of these where they can be profitably done away with. Bearings on the clutch and brake pedal shaft, clutch release shaft and brake rocker shaft, formerly lubricated by oil or grease, are replaced by bronze bushings with graphite inserts. These bearings, of course, function without any attention on the part of the owner. The improvement in the grease cup consists of the use of a new type of cup. In this design, a tight fitting piston, operating within a cylinder, forces grease to the bearings under a pressure which is claimed to be between 300 to 400 lbs. per sq. in. The piston in the grease cup is operated by a small wing nut.

CHANGE MADE IN CHAIN ADJUSTMENT

A new chain drive adjustment is utilized on this model. The chain is so designed that enough play is left in the chain, when properly adjusted, to permit an oscillation of one inch at the periphery of the fan. The adjustment is by means of an electric sprocket shaft. In the earlier models, the camshaft sprockets were integral and had their bearings directly upon the camshaft. This is no longer the case.

The camshaft sprockets, which are no longer integral, rotate upon eccentric surfaces located on a supporting member which is clamped into the crankcase by a locking device. The camshaft also rotates in a bearing carried in this support. By turning the eccentric surface by means of an adjusting worm, the center distances between the crankshaft sprocket and the camshaft sprocket, or between the camshaft sprocket and the fan sprocket, are increased, thus tightening the chain.

A lower center of gravity of the car is secured largely by lower wheels and is reflected in the appearance of the car. The radiator is higher and the shoulders have been raised and rounded with the result that the entire front end of the car is larger, since the higher shoulders on the radiator have necessitated a hood of more liberal dimensions. This appearance at the front end has been further improved by the use of Bausch & Lomb optical lenses on the headlamps and also on the little lamps on the sides of the car. The lines of the fenders have been altered and the rear quarters of the enclosed bodies have been changed from widely curved to slightly rounded corners.

Two new body styles have been added to the Cadillac line. These are the two-passenger coupe, which resembles the roadster in the arrangement of seats and storage space, and the four-passenger coupe in which entrance to the rear seat is afforded by tilting the seat on the right side.

The interior of the car has been entirely redesigned to carry out the general appearance scheme which distinguishes the car. For the sake of uniformity, particular care has been used in the metal selected for fittings. All of the levers and bright metal interior parts are of Duralumin forgings. The non-corrosive quality of this material has been taken advantage of with the result that the windshield wing nuts, the door handles, floor boards, kick plates under the doors, all match in color and style.

On the phaeton and sedan bodies, this is carried still further by the adoption of a trunk rack of the same material, which

provides six polished strips of aluminum running vertically on the rear end of the car between the tire carrier and body, carrying out the decorative effect.

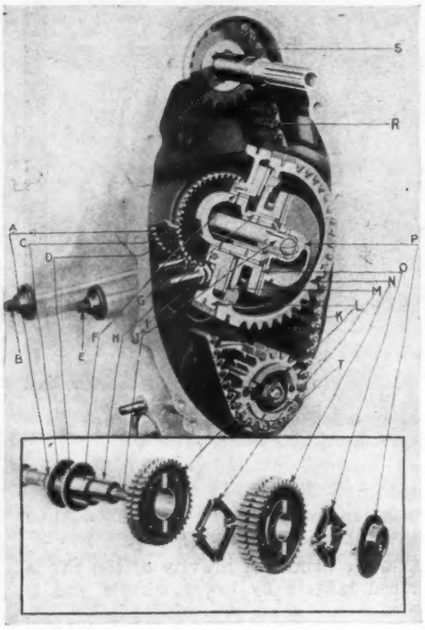
The entire front compartment has been made over from top to floor. All of the fittings have been made uniform, the instrument board conforming with the scheme of decoration on the car. The steering wheel is now made entirely of walnut, even to the spokes. The horn button is of the same wood and the rim of the wheel is molded to fit the driver's hand and is as free from metal as it is possible to make it. The tilting feature of the steering wheel, a charactristic of former Cadillacs, has been discontinued.

The instrument board is convenient and simple. It comprises a jet black oval plate in the center in which are mounted the switch levers and switch lock. On this plate is the Cadillac crest finished in enamel and gold. Below the oval plate and at either side are the buttons for controlling the fuel mixture when starting and deflecting the headlights. The dials of the ammeter and pressure gages are combined into one instrument at the left, which balances with a similar circle on the right containing the clock and speedometer, similar to the previous arrangement.

The pedal pads are forgings of Duralumin and the adjustment for the extension of the pedals has been discontinued to increase the cleanness of design. The hand brake now has a polished nickel grip in place of rubber. A new transmission lock has been provided supplementing the switch lock, and the switch key fits the transmission lock, as well as the tire lock.

All of these changes have been made without altering the specifications of the car, which remain the same. The price and weight also remain the same.

All Cadillac cars are now mounted on a 132 in. wheelbase chassis. Formerly, a 125 in. wheelbase was used to take care of certain body types, but now all are on the same standard length, giving a standardized manufacturing program, as far as the chassis is concerned. The cars are two inches lower. This has been accomplished by the use of wheels equipped with 33 by 5 in. tires in place of the 35 by 5 in. formerly employed.



CADILLAC TYPE 61 CHAIN ADJUSTMENT

Camshaft sprockets N and L are not integral nor do they bear upon the camshaft as in earlier eight-cylinder construction. The camshaft sprockets have their bearings and rotate upon eccentric surfaces H and F of the support C which is clamped into the crankcase by the locking collar A. The camshaft J rotates in bearings carried in the support C.

Shafts E and B fitted with worm gears I and G meshing with teeth cut upon the flange D of the support C and with teeth cut upon the collar serve as means whereby the collar A may be loosened or tightened and the support C turned.

Turning the support C by the shaft E, which may be done after the collar A is loosened by turning the shaft B in a clockwise direction, raises the sprocket N and lowers the sprocket L, as these sprockets have their bearings upon eccentric surfaces of the support C. In other words, the center distances are increased between the crankshaft sprocket T and the camshaft sprocket N and between the fan sprocket S and the camshaft sprocket L. The chains are thus tightened.

Camshaft sprocket N is driven from the crankshaft sprocket T by the chain K. Camshaft sprocket L is driven from camshaft sprocket N by a universal cross N through lugs on the inner surfaces of these sprockets. Camshaft J is driven by camshaft sprocket N through the universal cross O and the driver P. The fanshaft sprocket S is driven from the camshaft sprocket L by the chain R.

To make the adjustment, turn the shaft B six complete revolutions in clockwise direction. This will loosen the locking collar A screwed onto the inner end of the support C. Turn the shaft E in clockwise direction sufficiently to reduce the movement at the periphery of the fan to ¾ in., without slipping the clutch at the fan hub; then turn the shaft B in the counter-clockwise direction, thereby clamping the support F into place.

When chains become so badly worn that readjustment cannot be made, remove the offset link of each chain, and then loosen the locking collar by turning the shaft B six complete revolutions. Turn the shaft E in the clockwise direction, bringing the sprockets L and W into positions such that the chains can be replaced in pairs. Do not replace one chain only.

New Instrument Board Rheostat Reduces Charging Rate as Battery Becomes Fully Charged

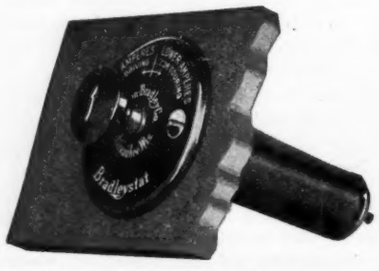
MANY are of the opinion that the automatic cutout mounted on the generator or on the dash regulates the amount of current flowing to the battery and as the latter becomes filled, disconnects it from the generator. This is an error which is daily costing thousands of dollars in battery repairs, for the reason that many batteries are kept in a perpetual state of overcharge.

This means taking frequent hydrometer readings, and, when they reach the value of 1.275 to 1.300, either to have the charging rate reduced by an adjustment of the generator, or resort to the other alternative of burning the lights during the daytime and also using the starter frequently for 30 to 40 seconds or more at a time. With the the "Bradleystat," manufactured by Allen-Bradley Co., Milwaukee, Wis., the driver can at any time by the slight turning of a knob reduce the amount of current flowing to the battery from the maximum of which the generator is capable of delivering, to a very low value only sufficient to keep the battery in efficient working condition.

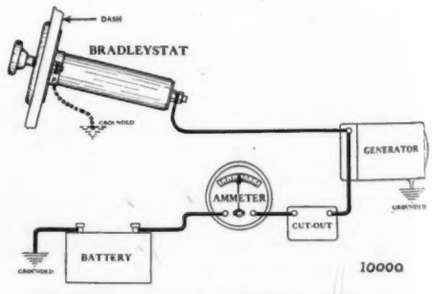
With the Bradleystat the connections are such that the ammeter is not interferred with and will still indicate the current flowing into the battery. The device is a small graphite compression type of rheostat. There is only one connection from the apparatus to the generator terminal. The return circuit is established through the grounding of the apparatus on the dash.

A slight adjustment of the thumb screw causes the excess charging current to flow through the Bradleystat tube and be absorbed in the form of heat, which would otherwise overheat the battery. The reaction in the generator will cause a definite current corresponding to any given speed, to flow in the external circuit; consequently, the device is said to be in parallel with the rest of the system, so as to divide the output from the generator into two portions, one of which goes on to perform the work of charging, while the other portion is returned directly to the generator without having gone through the battery.

The illustrations show how the device is connected into the car system without in any way interferring therewith and without the necessity of cutting or splicing any of the car wires. If the thumbscrew is completely screwed down, the generator will be practically short-circuited and little or no current will pass to the battery; while if, on the contrary, the apparatus is screwed out to its fullest extent all the generator current will flow to the battery and none through the device.



Dash control which regulates rate of battery charge



Schematic wiring diagram of Bradleystat

SOMETHING NEW Two Service Associations Give $16,000 for Mutual Advertising

New York and Brooklyn Organizations Try Daring Plan to Promote Business of All Members During FALL and WINTER Months—May Result in National Campaign

By Howard Pile

Technical Editor, Motor World

AUTOMOTIVE SERVICE ASSOCIATIONS of New York and Brooklyn are preparing to spend $16,000 on an advertising and direct mail campaign to avert the usual slump in winter automobile repair work. The appeal will be carried to the car owner to have the overhauling work which usually is put off until early spring done during the winter.

By appealing to the car owners in this way the associations believe that they will be abe to bring to their members sufficient work to keep the wheels turning and the organizations intact throughout the dull period.

Brooklyn started the movement a few weeks ago and mapped out the plan. An initial appropriation of $4,000 to be secured through voluntary subscription of members, was made. New York joined the movement with a $12,000 appropriation.

The plan is to use quarter-page advertisements in several daily newspapers, some morning and some evening, spreading these out so that every other day or every third day during the months of October and November one paper will carry the advertisement. This advertisement will be attractively gotten up by an advertising agency and will have cuts at head and foot. No individual names will appear in this advertising, but the signature will be that of the association.

50,000 FOLDERS FOR FOLLOW-UP

The copy will be prepared especially to get the interest of the car owner and set him to thinking of the advisability of having his work done early. To follow this up and clinch the argument there will be some 50,000 folders printed in two colors, also bearing the emblem of the service association, but with the name and address of the firm who has subscribed to the fund. This folder sets out three very forcible reasons why it is to the advantage of the car owner to have his work done NOW. The copy in the folder logically follows up the newspaper copy and focuses the appeal of the reading matter on the individual firm.

The benefits of this campaign are many. In the first place, the service associations are brought forcibly to the attention of the car-owning public, many of whom are ignorant of the existence of these organizations. The use of quarter page spreads over the various newspapers makes it almost impossible that any car owner in the territory can fail to see at least one of the advertisements during the ten weeks that the campaign will run.

Even if the car owner should by chance fail to see these, he is still caught in the mailing lists, because practically every established service station and repairshop will send folders to car owners on their lists. The advertising in the newspapers therefore serves an an opening wedge and gets interest. The folder follows and puts in concrete form what was covered more generally in the advertising.

The financial arrangements are such that the fund will be raised by subscriptions of $100 each. Of this amount, $25 will be paid on the signing of the contract and the balance in installments covering the ten weeks that the campaign will run. The associations will therefore have at all times money in the treasuries from the subscribers in advance of the time that money will be needed.

Subscribers to the fund will get the general advantage of the newspaper advertising and have their names printed on the folders. Non-subscribers to the fund who are members of the association will, of course, derive some benefit from the advertising, but they will not be able to follow it up. The prestige of the associations will be advanced and membership in them will therefore become more valuable.

While the idea is scarcely more than two weeks old and work has only been in actual progress a few days, subscriptions are already coming in fast and there is no doubt but that the plan will go through with a rush. **Already plans are being made to induce associations in other parts of the country to promote similar campaigns which will doubtless result in a decided increase in repair business in those localities.** It is quite possible that as the movement gains headway, national organizations will find it to their advantage to promote the idea, and the increase in service work will be felt all along the line, in the consumption of parts, accessories, tools and supplies.

Another desirable feature is that with the picking up of business in the ordinary dull period, many skilled men can be retained in the employ of firms who would be otherwise unable to keep their staffs up to normal. When laid off, these men drift from city to city and locate wherever they can find work, and the result has always been that when the spring rush starts it is impossible to get the workmen and often shops have to be manned with green hands, which practice results in confusion in the shop, delay in deliveries, and unsatisfactory work which has to be turned back to the shop.

The campaign in Brooklyn is in full swing and the campaign in New York has just started. Forty teams of two men each are visiting responsible firms and asking for their subscriptions, carrying with them samples of the advertisements and folders. The first half hour of the drive resulted in six subscriptions, so the plan is evidently being favorably received.

ADVERTISING AUTOMOBILE SERVICE

Never before has anything just like this been attempted in the automobile business, although it has been successfully carried out in other lines of business. Coffee growers are at the present time carrying space in dailies urging the public to drink coffee. Not some particular kind of coffee, but just coffee. We see in the street cars the slogan, "Wear suspenders." No particular brand of suspenders, but just suspenders. The anthracite coal operators are running space attempting to justify themselves in the minds of the public for the seeming high prices of coal.

And so it goes. **Why not advertise automotive service?** It has never before been done collectively, and it seems certain that this initial trial will result successfully. In another year the movement will no doubt have gained momentum and will receive more widespread support and may become a national campaign backed up in many other ways.

EDITORIAL

Intelligence in Insurance

AS A RESULT of the recent conferences among automobile insurance companies, chiefly with each other, but occasionally with representatives of the industry, comes a conclusion that may eventually solve several of the very perplexing problems connected with the insurance of cars and the licensing of drivers.

This conclusion is that the moral hazard is the chief factor involved. This moral hazard rests in the owner or driver of the automobile. Undoubtedly the insurance chiefs have at last hit on the key to their problem and, if they will only pass this information along to the misguided individuals who have attempted to reduce traffic accidents by a purely mechanical method, they will have done much for the automotive industry, for the great mass of honest and reasonable persons who drive cars and for the pedestrians who are in constant danger because of the present loosely constructed and inadequately enforced traffic laws.

The practice of insuring an automobile for whatever the owner said it was worth was as silly a bit of business as ever was attempted. The same insurance company would not do that for the small merchant whose stock was worth no more than a good automobile. If the merchant is allowed to name the amount of the policy, he is required to prove from his books the settlement value in case of fire or theft loss. Yet this same merchant's word would be taken for the value of a motor car.

It is the same in driver licensing, where attempts have been made to stop accidents by examining drivers for mechanical ability. The insurance company's own records will show that it is not the new driver, nor the incompetent who causes accidents. It is the driver who has not a proper regard for the rights of his fellowman; who drives swiftly and recklessly in places where it is not safe for other persons. There is no other line of business which involves an equal amount of money as the ownership of an automobile, or the rights of other persons as the driving of a car, that has been handled in so absolutely silly a manner.

With a Thought to Convenience

INCORPORATED in the design and construction of some of the new models for next year are certain features which will make a direct appeal to the service man and incidentally to the car owner. Designers are giving more thought to accessibility, not only to those things which have to do with the repairing of cars, but the more common service operations.

For example, the job of draining the water systems on many of our cars is a difficult matter, because of the inaccessible position of a small drain plug located in almost any position under the radiator. Frequently too, this plug is so located that it comes directly over the front axle, not only splashing water in all directions, but making it difficult to place a bucket under the drain.

One of the lesser features though very important to the service man—is the location of the water system drain on the Cadillac type 61, just announced. Instead of the mechanic or owner having to get under the car and search for a small pipe plug to unscrew, the job on the Cadillac resolves itself into the simple process of opening a valve with a screwdriver, the valve being accessible in the engine compartment with the operator standing in an upright position. It saves time, and there is no chance for the operator to get his hands or clothing wet.

It is hoped that the same methods of draining might in time be applied to the drainage of the oil in the crankcase. This still is quite a job. Some day probably some genius will come along with a device that can be operated from above, so that a service man can drain out the old oil as quickly as fresh oil can be put in the engine. Essentially such a drainage scheme should be such that there is ample assurance that the splash troughs under the connecting rods will also be drained.

An Important Movement

THE entire automobile maintenance industry should be interested in the decision of the Automotive Service Associations of New York and Brooklyn to spend a considerable sum of money in advertising to avert the usual winter slump in business. This movement will carry into effect a plan often suggested in MOTOR AGE, that the maintenance interests have much in common and should work together for the purpose of promoting business, both by getting more business and by raising the standard. The results of this campaign will be watched for with interest.

Time Study Sheet

IT is frequently a matter of speculation in the MOTOR AGE office as to what proportion of maintenance shops keeps a record of the time required for particular operations in that shop.

A considerable number of shop managers appear to be puzzled by this problem of knowing how much time a mechanic should be permitted for a particular operation. They ask outsiders for information on this point, which should by all means be answered in the shop, where there is an intimate knowledge of the equipment at hand for the job, where the arrangement of the tools, big and little, are known. Of course, records are kept for the purpose of making out the bill, and all of these time records should be placed on a "Time Study Sheet."

This sheet, after the operation is performed a few times, will supply a basis of comparison. If one man does the job in less time than the others, ask him how he did it. Then make his method the basis of all similar operations until a quicker or better method is found. Such a comparison of the jobs furnishes the best possible method of checking up against waste time in the shop.

No Serious Slump in October or November

Conditions Warrant Belief of No Slump in Fall Trade

Inventory Liquidation and Increased Labor Efficiency Have Contributed Strongly to Reductions

NEW YORK, Sept. 26—Summarizing conditions in the automobile trade, "Automotive Industries" will say this week:

The feeling of confidence engendered in the automotive industry by the unexpectedly good business of the summer months is being sustained by the September sales showing and the belief that there will be no serious slump in trade in October or November.

Liquidation of high priced inventories by passenger car makers is rapidly nearing completion and they are buying supplies at the market. There also has been a gratifying increase in the efficiency of labor. These two factors together have been responsible in no small degree for the substantial price reductions which have been made and which have been passed on to the "ultimate consumer," in marked contrast to the situation in many other lines.

There is a striking disposition throughout the industry to be mutually helpful. The parts and accessory manufacturers are fully alive to the difficulties confronting the vehicle makers and are disposed to assist them in every way possible. In respect to inventories and labor, the parts makers are in much the same position as the car manufacturers. This has been reflected in substantial reductions within the past few days in some of the most important unit parts used in assembled cars.

While there has been a slight falling off in sales of passenger cars at retail in the great industrial districts, this has been balanced by increased business in the south and in the leading agricultural sections where farmers are liquidating their bank indebtedness and are replacing some worn automotive equipment. Reports of better business in the south are particularly encouraging.

It is notable that the feeling in Detroit is increasingly hopeful. Employment figures for that city show that there has been no decline in the number of men employed, although a few more are on part time. Ford production for September will run several thousand behind August, but this is not due to lack of orders but rather to manufacturing complications. Ford sales were stimulated to a marked degree by the most recent price reductions and the company has sufficient orders on hand now to keep it going at capacity until Nov. 1. Dodge, Studebaker, Buick, Nash and Reo are behind on deliveries. An indication that the companies in the higher priced class are feeling the beneficial effects of the generally brighter outlook is found in the fact that September will be the best month the Lincoln Motor Car Co. ever has had.

The entire industry is centering its attention to a greater degree than ever before on the question of service and the needs of car owners. This probably will result in fewer complaints in the future about high upkeep costs and unsatisfactory repairs.

Automobile Responsible for Milwaukee's Bright Report

Milwaukee, Sept. 26—The most encouraging report made within a year's time concerning the conditions of business in Milwaukee and vicinity is that contained in the current issue of Business and Financial Comment, published monthly by the First Wisconsin National, Milwaukee's largest bank. The review credits the automotive industries with much of the responsibility for the improvement. It says in brief:

"The drift of business in Milwaukee may be tested by three factors—capacity of operation, number of men employed, and sales. The metal trades as a whole increased their capacity of operations about 10 per cent in the last month. For this result the automotive group was largely responsible, as will be seen from the figures of employment. Iron, steel and their products lost 1.8 per cent in number of employees, and metal products other than iron and steel lost 20.3 per cent, while the automobile, parts and accessories group gained 23.4 per cent. In the whole metal trades group, sales were about 30 per cent better in August than in July, but compared with August, 1920, they were about 40 per cent smaller."

CLEVELAND ENCLOSED CAR WEEK

Cleveland, Sept. 26—The Cleveland automobile industry will observe Enclosed Car Week Oct. 15 to 22. Observance of the week is to be a national event and the participation of the trade in Cleveland was authorized by the board of directors of the Cleveland Automobile Manufacturers & Dealers' Assn.

The display of enclosed models was determined upon at a meeting of the National Association of Automobile Show & Association Managers, held in Chicago Sept. 15 and 16, and the Cleveland organization promptly signified participation in the national event.

While the entire country has acclaimed the serviceability of sedans, coupes and similar models, this region has acclaimed them with unusual vigor, due perhaps to the changeable climate prevailing in the Great Lakes section.

It is expected that Enclosed Car Week will be made an annual event on a country-wide scale.

Collins and Durant Plan Control of Peerless Plant

Negotiations for the Sale of Large Block of Stock Are Said to Be Favorable; Price Named

CLEVELAND, Sept. 24—Negotiations for the acquisition of control of the Peerless Truck & Motor Corp. by R. H. Collins, former president of the Cadillac Motor Car Co., and his associates, have not been concluded. The indications are said to be favorable to a successful termination of negotiations. Attorney George B. Siddall of this city, who is secretary of the Peerless company and has been named a committee with B. G. Tremaine, president and general manager of the corporation, to negotiate the deal, issued the following statement:

Negotiations for Sale Pending

"The trade with Collins has not yet been made, but negotiations are still pending. Progress has been made, but in a transaction of this importance there are many points which must be covered. The stockholders of the company may rest assured that all of them will be treated alike. It probably will be several days before the matter will be brought to a conclusion."

Although no announcement as to details has been made by anyone participating in the negotiations, information concerning it became available when circulars that are to be mailed to stockholders were seen. These are to be put in the mails when necessary signatures to the contract are obtained. The circular says that the negotiations at present are limited to B. G. Tremaine and his associates, who are now virtually in control of the management of Peerless and its subsidiaries, and R. H. Collins, acting for himself and his associates for the sale of shares of stock in the corporation. W. C. Durant, former president of General Motors Corp., is allied with Collins. Another well defined report is that Collins will assume active management and that his word will be law as to whether or not there shall be changes in the personnel of officers and directors.

All stockholders of the company are to be given an apportunity to sell their stock to Collins and his associates. Tremaine stipulated this should be done and his proposal has been accepted. Collins, according to information contained in the circular notices that are ready for mailing to stockholders, is to purchase at least 50,000 shares and not more than 80,000 shares of the 200,000 shares outstanding. He is to pay $50 a share for the stock, of which not less than $10 a share shall be paid in cash and the bal-

(Continued on page 20)

Collins and Durant Plan Control of Peerless Plant

Negotiations for the Sale of Large Block of Stock Are Said to Be Favorable; Price Named

(*Continued from page* 19)

ance in six equal installments which shall be paid semi-annually over a period of three years with interest at 6 per cent.

Stockholders who desire to sell on the terms given will be asked to deposit their shares with the Cleveland Trust Co. In the event that more than 80,000 shares are deposited under the agreement, the amount of each stockholder's stock to be sold shall be of such proportion as 80,000 shares shall bear to the total number of shares of such stock deposited. Thirty days are given for the consummation of the sale under the depository agreement; provided, however, that the attorneys may grant an extension to not later than Nov. 15.

The Peerless company when operating normally employs 2500 men. The plant covers 20 acres and it has continued its payment of dividends this year. It has paid as high as 10 per cent annually on outstanding stock, and the dividend this year is 4 per cent. The corporation has a capital of $20,000,000, with approximately $10,000,000 outstanding.

New York, Sept. 26—W. C. Durant personally is associated with R. H. Collins in the negotiations for control of the Peerless plant, but Durant Motors, Inc., is not involved. In this respect the relations of Durant with Collins are no different than they have been since the announcement several months ago when Collins left the General Motors Corp., that he would incorporate the Michigan company to manufacture a high-class eight-cylinder car.

Soon after the original announcement of Collins' plans he purchased one of the large units in the old Cadillac plant at Detroit. If his offer to the Peerless company is accepted the Detroit factory will be used for other purposes which he has in mind.

Acquisition of a well equipped factory such as that of the Peerless company will give Collins an opportunity to get to work at once with the organization he has built up. His proposal to the Peerless company contemplates the complete redesigning of the car, with the exception of the engine, which he regards very highly. It is probable that in this redesigning he will put into effect most of the ideas he has had for a new car.

UNDERWRITERS TO MEET

Chicago, Sept. 26—The Automobile Council of the Underwriters' Laboratories will meet at the Chicago office of the laboratories, Oct. 3, the day before the meeting of the rates committee of the National Automobile Underwriters' Conference.

Possible increases in the present standards of the laboratories covering test requirements for automobile bumpers and consideration of a possible grading of automobile locking devices with reference to their merits are among the questions that are expected to be discussed.

Plan Avoids Assessments in Moline Reorganization

Chicago, Sept. 24—The new reorganization plan for the Moline Plow Co. was made public here yesterday by Frank O. Wetmore, president of the First National Bank and chairman of the bankers' and creditors' committee of the company. The plan provides that all debts of the company, amounting to slightly less than $25,000,000 with interest, will be discharged with 50 per cent of bonds, 50 per cent of first preferred stock and a bonus of common in a new company.

About 60 per cent of the creditors have accepted the plan, but until the remaining creditors act favorably upon the plan it cannot become operative. There may be some slight changes in detail, but the committee believes that the plan in its general aspect represents the only alternative to a receivership.

Without assessment the old securities will be exchanged for new, of which there will be authorized $12,500,000 first preferred, $7,500,000 second and 200,000 shares of no par value common.

The plan when worked out will leave the company without current debt, will write out all losses suffered in operations and inventory reductions, provide for the elimination of unprofitable units, and will enable the company to face new conditions in a strong financial condition.

Kess-Line Eight to Make Its Bow at National Shows

Detroit, Sept. 26—Kess-Line Motors, an offspring of the Kessler Motor Co., will take possession of the former Liberty Motor Car Co. plant here on Oct. 1 and will prepare for the production of the Kess-Line eight, which will be introduced at the national automobile shows in January.

The factory will afford 70,000 sq. ft. of manufacturing space and will have a production capacity of 60 cars a day. It is located on the Detroit Terminal line and is well planned for automobile manufacture. Officers of the company are M. C. Kessler, president; W. H. Radford, vice-president, and H. H. Scott, secretary and treasurer. The officers are well known in the industry, Kessler being president of Kessler motors, Radford an executive prominent in car manufacture since 1903, and Scott a former executive of the Fisher Body Co.

New York, Sept. 26—The second annual convention of the Automobile Financing Credit Men's Assn. will be held at Cleveland, Oct. 7. Fred Weber, Jr., of the Bankers' Commercial Security Co., New York, is president.

Hare Relations with Kelly-Springfield to Continue

C. W. Young Is President of Truck Company; E. O. McDonnell Is General Manager

NEW YORK, Sept. 26—Although Emlin S. Hare has resigned as president of the Kelly-Springfield Motor Truck Co., and the other representatives of Hares Motors who were officers of the truck company have resigned, it is said that the two corporations have renewed their relations in the sales field and that Hares Motors will continue to offer a complete line of trucks ranging from 1½ tons to 6 tons capacity, with a wide selection of wheelbases, frame lengths and gear ratios. Charles Willard Young of Emerson McMillin Co. has been elected president of the truck company to succeed Hare.

Edward O. McDonnell of this city, who has been appointed general manager of the Kelly-Springfield plant at Springfield, O., is a graduate of Annapolis and during the world war served as a personal representative of Admiral Sims in procuring the material and personnel for the North Sea mine-laying project, which involved for materiel the expenditure of $40,000,000.

A statement by Hares Motors in reference to its future plans says that abrogation of the Locomobile and Mercer contracts will not interfere in any way with its original plans, which call for the production and marketing of passenger cars to sell for $1,700, $2,500 and $4,500.

Hares Motors of New England has taken over the distribution of the Saxon car.

MERIT LOWERS PRICE

Cleveland, Sept. 26—The Merit Motor Co. has reduced the prices of its two-passenger and four-passenger models from $2,245 to $1,985.

DRIVES 116 MILES PER HOUR

Chicago, Sept. 24—A report from the Berliner Lokal Anzeiger says that Hoerner, driving a 200-hp. Benz, set a new world's speed record when he made 116 miles an hour on the new Berlin speedway. A 150-hp. Benz attained a speed of 111 miles an hour, according to the same report.

ANDERSON AGAIN REDUCES PRICE

Rock Hill, S. C., Sept. 26—The Anderson Motor Car Co. has made another reduction in prices on its various models. It covers the new line which is now being turned out. The price list is as follows:

	New	Old
5-passenger touring	$1,650	$1,795
7-passenger touring	1,795	1,345
Coupe	2,450	2,795
Sedan	2,550	2,795

No change has been made in the price of the two-passenger speedster, which remains at $2,195.

Gasoline Tax in 14 States Adds $6,000,000 Car Burden

Impost Is Discriminatory and Is Classed as "Stigma" — Other States to Follow Example

NEW YORK, Sept. 26—Ten new states bring the total to 14 which added taxes on gasoline consumption at the 1921 sessions of their legislature. A report on this subject compiled by Harry Mixell, secretary of the Motor Vehicle Conference Committee, shows that this action will add at least $6,000,000 to the taxes paid by motor vehicle users.

When the present year began, the four states which had a gasoline tax were Colorado, Kentucky, New Mexico and Oregon. The states which so far have added the tax this year are Arizona, Arkansas, Connecticut, Florida, Georgia, Montana, North Carolina, Pennsylvania, South Dakota and Washington. The tax is one cent a gallon in all states except New Mexico where it is two cents.

The chief objection to the imposition of a gasoline tax is that it is discriminatory and adds another impost to the "stigma taxes" which have been inflicted on the industry. The tax also discriminates against motor vehicles propelled by internal combustion engines, in favor of those driven by steam or electricity. It is probable that agitation over a gasoline tax will be taken up in several other states at the coming sessions of their legislature.

ATTERBURY LOWERS PRICES

Buffalo, Sept. 24—Effective Oct. 1 the Atterbury Motor Car Co. has named new list prices for its motor trucks. The new prices compared to the old are as follows:

	New	Old
Model 20R	$2,475	$2,775
Model 70X	3,175	3,375
Model 7D	3,975	4,175
Model 8E	4,975	5,575

HOLDS ELECTION TO ADVERTISE

Birmingham, Ala., Sept. 24.—Much interest is being taken by the public in the straw vote on the approaching city election, according to officials of the Cruse-Crawford M'f'g Co., who are conducting the vote as an advertising stunt to stimulate their tire sales. Anyone can participate in the straw vote without charge, and the person holding the winning ticket at the close of the contest will be presented with four Firestone cord tires and a Firestone tube.

OHIO SHOW SELLING SPACE

Columbus, Sept. 26.—The Ohio Automobile Trade Assn. is making elaborate preparations for the coming annual meeting which will be held in Columbus the second week in December. One of the features of this meeting will be a large display in Memorial Hall, consisting of the latest appliances, equipment and supplies for the service station and garage, as well as graphic illustrations of all new ideas, in selling passenger cars and trucks. Applications for space in this display are already being received. The Ohio Accessories Jobbers Assn. will participate in the display. The membership of this organization comprises the leading accessory jobbers of the Buckeye State.

The sessions of the convention will be held at the Elks' Home, adjoining Memorial Hall.

'Hello!' 'Hello!' Two Trucks Are Sold

PORTLAND, Ore., Sept. 24—Motor trucks are being bought by telephone in Portland now. Closing deals for passenger cars by phone has not been altogether uncommon but it is rather out of the ordinary for a business man to call up a truck dealer and place an order, according to H. H. Harwood, manager of the Portland branch of the Mack International Motor Truck Corp.

Last week a truck was sold by this concern over the telephone to Kenneth Poorman, who requested that a 3½-ton Mack be delivered to him that day and after the management found that the machine was in stock of the correct wheelbase and other specifications were O. K., the order was closed and the purchase delivered the same day. This is the second telephone order received and truck delivered by this concern recently.

FORD SCHEDULE NOT CUT

Detroit, Sept. 24.—Reports that the Highland Park plant of the Ford Motor Co., would be operated hereafter on a five-day basis are emphatically denied. The plant was closed Sept. 17, to balance stock, but work was continued as usual at all branches. The monthly production schedule has not been changed.

GRANT MAKES "EXTRAS" STANDARD EQUIPMENT

Cleveland, Sept. 29—Grant Motor Car Corp., Cleveland, has made the "extras" on the Grant Six standard equipment, with no increase in price of the car. The following items have been added: wood disk wheels, spare cord tires, Neville steering wheel, drum shape lights, parking light on cowl, double front bumper and single rear bumper.

WILLS DISTRIBUTORS MEET

Detroit, Sept. 26—The first meeting of distributors of C. H. Wills & Co. was held at the factory in Marysville, with practically all of the sales organization represented. The outlook for improved business in the Wills Sainte Claire was predicted to be highly favorable. E. C. Morse, new sales manager of the company, addressed the convention, outlining new sales policies which would be introduced under his administration.

Dealers May Recover Rum Cars by Paying All Costs

United States Court Recognizes Property Rights of Men Selling Automobiles on Installments

BRIDGEPORT, Conn., Sept. 24—Automotive interests regard as of much importance the ruling of Judge Edwin S. Thomas of the United States District Court at New Haven, to the effect that dealers who have sold cars on the installment plan, which have been seized by the government while in use for transportation of liquor, may secure possession of the cars upon payment of the costs of the storage and other incidentals to the seizure—providing the amount due to the lien holder is not offered when the car is put up for sale at public auction. The ruling was made after the question had been brought to his attention by Assistant District Attorney George H. Cohen, who explained that there were several cars being held by the government which could not be sold for enough to pay the balance due on them.

Cars Sold at Auction

The law provides that when an automobile or other vehicle is taken while in use for illegal transportation of liquor that it shall be forfeited to the government and sold at auction. It developed in the early days of the seizing of cars, however, that a majority of the cars seized had been bought on the installment plan and the dealer selling the car retained title to it until the amount was fully paid. Orders for the sale of such cars provided that lien holders should be paid the sum due them out of the price realized by the sale of the car; consequently, when offering the cars for sale, United States Marshal Palmer named the amounts due on the former liens as the lowest bid he would consider. Frequently the drivers of the "rum running" vehicles have used the cars so roughly that when they are offered for sale they are little more than "scrap."

TO CHANGE MEETING DATES

Salt Lake City, Sept. 24—Directors of the Intermountain Automotive Assn. feel that one meeting a year is not enough to keep the association in close touch with activities in the industry and it has been decided to hold the meetings at least every six months. The next meeting will be held in this city Oct. 8.

MARMON IN NEW FOLLOW-UP

Toronto, Sept. 24—An interesting method of following up the motor show at the Canadian National Exhibition has been worked out by the Marmon distributors here, who have sent out cars on a demonstration tour of the province to reach prospects whose names were obtained at the show.

Wyoming First in Rank in Far-West Car Registration

Seven Months' Record of 1921 Shows Greatest Increase Compared with Totals for 1920

PORTLAND, Ore., Sept. 26—In a comparison of the rate of increase in the use of motor vehicles the state of Oregon is at present enjoying a greater degree of prosperity than any other state of the Pacific northwest, excepting Wyoming, according to Sam Kozer, secretary of state for Oregon, who has made public figures which he obtained through an analysis of the situation in Arizona, Colorado, Idaho, Montana, Nevada, Oregon Utah, Washington and Wyoming.

"Registration of motor vehicles in Oregon for the first seven months of 1921 shows a greater percentage of increase in comparison with the total registrations during the year 1920 than is shown by the available official records of any other western state except Wyoming, eliminating California, for which similar records are not available," said Secretary Kozer.

Such a comparison shows, his report indicates, that during the first seven months of 1921 there were registered in Oregon 105.3 per cent of the number of cars registered during the entire previous year of 1920. Figures for the other states show the following percentages: Arizona, 95.24 per cent; Idaho, 93.58 per cent; Montana, 89.61 per cent; Utah, 100.84 per cent; Washington, 90.63 per cent; Colorado, 96.4 per cent; Nevada, 99.05 per cent, and Wyoming, 105.75 per cent. The last three mentioned states have provided figures only to cover the first six months of 1921 and thus would make a slightly better showing if July, 1921, registrations were also included.

A study of motor vehicles registrations in proportion to population, also made by Kozer, shows that in this regard Washington is in the lead among the far western states, excluding California, for which statistics are not available for such a comparison, while Oregon is third. Giving his figures on this feature of his study Kozer says:

"Official figures received from eight other western states show that during the first seven months of 1921 Arizona registered one motor vehicle to every 9.67 persons, Colorado one to every 7.27 persons, Idaho one to every 8.49, Montana one to every 9.05, Nevada one to every 7.39, Oregon one to every 7.54, Utah one to every 10.55, Washington one to every 7.15 and Wyoming one to every 8.6 persons. The states mentioned thus rank in the following order in ratio of motor vehicles to total populations: Washington, Colorado, Oregon, Idaho, Wyoming, Montana, Arizona, Utah."

A study of motorcycle registrations in 1920 shows Oregon to be in the lead among the far western states excluding California. Oregon is shown to have one motorcycle to every 223 persons, while the other western states are as follows: Washington, one to 270; Colorado, one to 275; Utah, one to 404; Idaho, one to 565; Montana, one to 813; Arizona, one to 833; Nevada figures are not given, as separate motorcycle registrations are not taken there.

Taking up the Oregon figures more in detail, Kozer shows that a study of the registrations in 1920 reveals that slightly over 13 per cent of the residents of Oregon registered motor vehicles during the year. The exact percentage was 13.24884, based upon the official 1920 census of 783,389 persons and a total registration of 103,790 vehicles. The registrations for 1921 have shown an increase of 5509 vehicles up to Aug. 1, over the total of last year, but there is no census available upon which to make a comparison of the present percentage of cars to population.

New York Dealers' Assn. Birthday Set for Nov. 21

State Organization Will Be Started at Syracuse; Enclosed Car Week Movement Grows

SYRACUSE, Sept. 24—Preliminary organization of a New York state association of automobile dealers will be made at a meeting here Nov. 21, according to plans endorsed by members of the Syracuse Automobile Dealers' Assn. The formation of the state association will be backed by the National association, which will send Harry G. Moock, general manager, and several assistants here to handle the project.

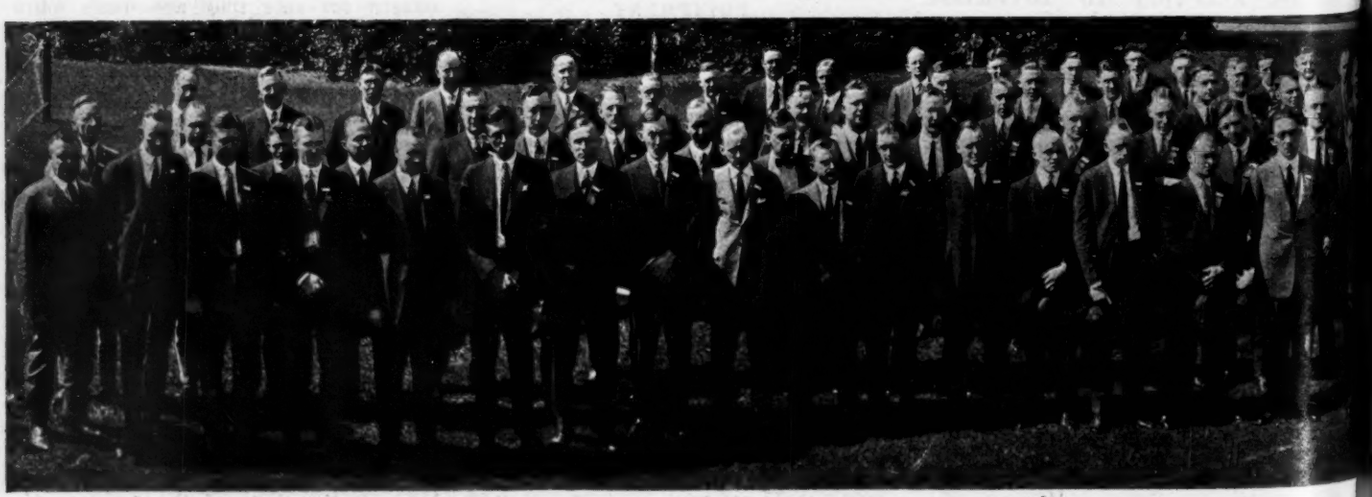
Associations in New York, Brooklyn, the Bronx, Rochester, Binghamton, Albany, Elmira, Utica, Watertown and Niagara Falls are expected to send representatives to the big meeting here next month and tentative plans call for a big mass meeting of dealers of the state in the assembly chamber at Albany in December, in furtherance of the campaign. All-around betterment and standardization of business is sought through the organization of a state body.

Plans for Enclosed Car Week here beginning Oct. 17 are almost complete. Howard H. Smith, secretary of the local association, who has just returned from the convention of association managers and secretaries in Chicago, reported that at least 20 large cities will participate in National Enclosed Car Week Oct. 15-22, the outgrowth of the enclosed car event held in Syracuse last fall.

OREGON DEALERS EXHIBIT

Salem, Ore., Sept. 26—The automobile and accessory show in connection with the Oregon State fair, Sept. 26-Oct. 1, has eclipsed all similar exhibits. Virtually every foot of space in the big pavilion is occupied by Portland and central Oregon dealers.

Branch Managers of Gill Mfg. Co., Their Sales Forces and Facto



The annual sales convention of the Gill Mfg. Co. was held at the Chicago Beach Hotel during the week of Sept. 19. Representatives from all parts of the country were counted in the attendance of 150, which included the 39 branch managers and members of their sales organizations, together with the factory sales department. Following the first

Bankers Name Automobile Retail Line Best Seller

Business Conditions in Industry Attributed to Keen Advertising and Vigorous Merchandising

CLEVELAND, Sept. 26—The retail automobile business here is in better condition than is any other retail line, according to expressions heard at the annual meeting of Group Nine of the American Bankers' Assn., which was held recently at Chippewa Falls.

Bankers throughout the northern tier of Ohio counties attended the meeting, and virtually reported that the retail automobile dealer was giving them less trouble with financing demands than other lines of merchandising. Trade is brisker with automobile dealers than it is with the average retail merchant in other lines, according to reports from this city, Akron, Ashtabula, Sandusky, and Lorain.

Just credit for these conditions was given to price reductions, smart advertising and keen merchandising methods. Bankers were urged to do what they can to continue reductions in the prices for material and labor, and also to encourage buying. This appeal was made by H. K. Ferguson Co. of this city.

Milwaukee Dealers' Assn. Plans Educational Campaign

Milwaukee, Sept. 26—P. E. Chamberlain, formerly of Denver, Colo., who has been conducting lecture classes for dealer organizations in various parts of the country has made arrangements with the Milwaukee Automotive Dealers' Assn. to give his lecture course to the entire automotive trade of this city, under its auspices. Each dealer organization has enrolled its employees, both men and women, and an average attendance of more than a thousand is confidently expected by the directors of the association.

Chamberlain's lectures cover a period of four consecutive nights and treat with subjects of a fundamental nature with their particular application to the automotive trade. The action of the Milwaukee Automotive Dealers' Assn. in recognizing that educational work is the legitimate function of association work, has made it possible for everyone engaged in the industry in this city to obtain a better understanding of the basic laws of business upon which rests their individual and collective development.

Opening on Monday night, Sept. 26, the course will continue to and including Thursday the 29th, and the following subjects will be treated in order: "Responsibility," "Organization," "System and Waste," and "Methods of Estimating, Pricing and Intelligent Selling."

STEPHENS MAKES SECOND DROP

Freeport, Ill., Sept. 26—The Stephens Motor Works has made a further reduction of $100 to $215 on Stephens Salient Six automobiles. The new schedule of prices affects all models and is as follows:

	New	Old
Roadster	$1,800	$1,900
Special roadster	1,900	2,000
Four-passenger touring	1,850	1,985
Special four-pass. touring	1,950	2,085
Six-passenger touring	1,850	2,065
Seven-passenger sedan	2,850	3,100
Four-passenger sedan	2,850	3,100

KISSEL TRUCK PRICES REDUCED

Hartford, Wis., Sept. 26—The Kissel Motor Car Co. of this city will make price reductions of $600 to $1000 on four truck models.

The new prices compared to the old are as follows:

	Old	New
General Utility	$2,775	$1,975
Freighter	3,475	2,875
Heavy Duty	4,475	3,675
Goliath	5,085	4,085

August Automotive Exports Increase Over July Reports

Products of Year Ago to Foreign Countries Were From Two to Eight Times Greater

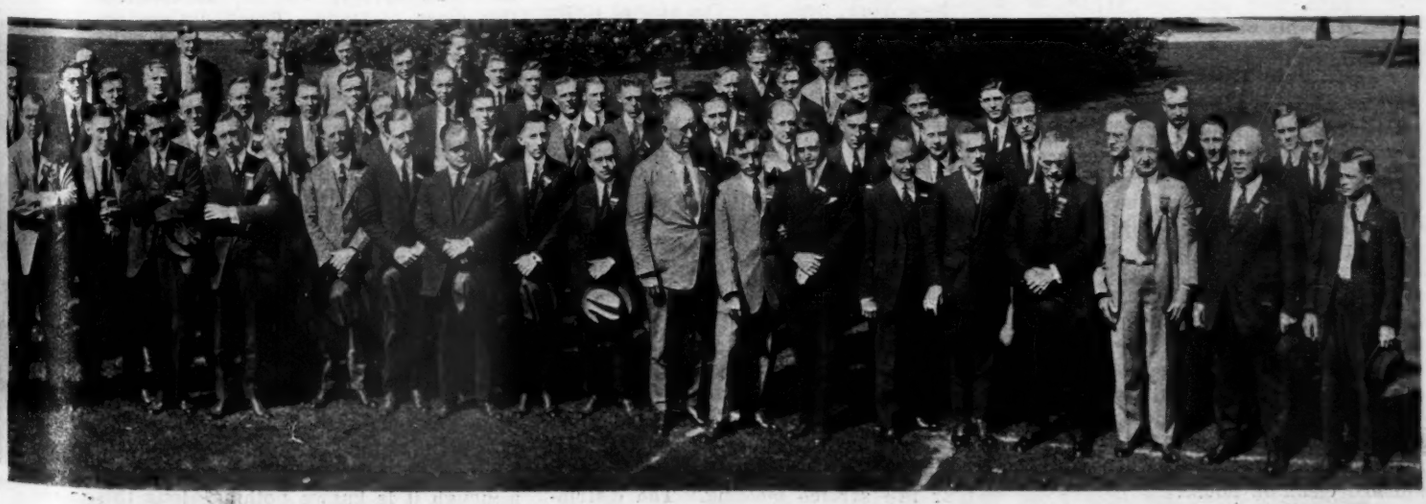
WASHINGTON, Sept. 26—Statistics of automotive exports for August, compiled by the Bureau of Foreign and Domestic Commerce, show a slight increase in the value of passenger and commercial cars and airplane parts, as compared with the previous month. Unfortunately, this gain is more than offset by declines in other automotive commodities offered for export. The figures show that exports of automotive products were from two to eight times greater during August, 1920, than for the same period this year. A smaller ratio obtains on the total exports for the eight months ending August.

Though the number of trucks have declined 18, the value of commercial cars exported during August was $119,815 greater than the previous month. Exports of passenger cars increased by only 14 during August, but the value exceeded that for July by $381,960. The notable increase was in the value of airplane parts, the gain amounting to $12,561 for August, 1921, as compared with the previous month.

Shipment of parts, not including engines and tires, fell off approximately $200,000 during August. Compared with August, 1920, the decline amounted to $4,329,059, and the value for the eight months' period ending August, 1921, was about half the amount for the same period last year.

There has been a marked decline in the value of tractor engines exported, as the shipments for August of this year amounted to two, as compared with 1,497 engines valued at $1,122,940 for August, 1920.

Representatives Hold Convention in Chicago During Week of Sept. 19.



two days, which were given over to athletics and the renewing of old associations, a three-day business program was carried out, during which sales and advertising plans for the coming year were discussed. "Constructive Salesmanship" was the subject of an address given by Harry C. Spillman at the banquet which was held at the Beverly Country Club. E. P. Chalfant, president of the Gill Mfg. Co., presided as toastmaster.

Chicago Garagemen Endorse A. E. A. Merchandising Plan

Many Owners Declare Accessory Sales Department Represents Large Part of Year's Profits

CHICAGO, Sept. 25—At a meeting of the garage owners of Chicago, held under the auspices of the Chicago Garage Owners' Assn., Wednesday night at the Hotel La Salle, interesting facts concerning the financial value and salability of automotive equipment in the garage were brought out.

After the regular business meeting President Emery of the association turned the meeting over to Ray W. Sherman, merchandising director of the Automotive Equipment Assn., who invited discussion for the purpose of ascertaining, if possible, the attitude of the garage owners towards the automotive equipment end of their business.

He first called on H. G. Williams, who operates a large garage in Evanston, Ill., asking him how his automotive equipment department was conducted and what he thought about it.

Williams said: "I have always carried as large a stock as possible, and four months ago I enlarged my equipment department and am endeavoring to do away with as much of the heavy repair work as possible. I find that it is a great way for the garageman to make more money without getting all greasy and dirty. I always try to keep the articles that my customers ask for, and sell them something in addition. For instance, tonight, just before I left the garage a new Ford drove in for an extra tire and tube. I called the owner's attention to the fact that he had a new rim, tire and tube, but nothing to prevent some thief from relieving him of the whole outfit. As a result of this remark I sold him a tire lock."

When Fred Daniels, who operates the Terminal garage, one of the largest on the north side of Chicago, was asked his opinion, he said:

Large Receipts on Equipment

"I wouldn't run a garage without selling automotive equipment, since 40 per cent of my gross receipts for last year came from my equipment department. Many months of this year the receipts from the selling department have equaled the income from the remainder of the garage. I opened my supply department in January, 1920, with about $2,000 worth of stock. In an endeavor to keep the articles that my customers ask for, I have been forced to increase this considerably.

"My window displays are very effective, selling many articles to people who are not even car owners. A woman came in the other day for a cake of mechanic's soap to use when she had finished cleaning house."

Henry May of the Speedway Garage put in a $200 stock of supplies six years ago. Shortly after the conclusion of the armistice he took inventory and found that he had over $40,000 worth of equipment. He felt that this was too much and decided to liquidate over half of it. He expected to lose a little but was agreeably surprised when he had reduced his stock to $18,000, that he had made a very substantial profit.

L. C. Larson, owner of the Clifton Garage, has obtained good results from pushing one special article for a week or so at a time. He started in with a $400 stock of equipment and has steadily increased it until he now has a $4,000 stock. In addition to pushing his leader, Larsen says he looks the cars over to see what they need and endeavors to supply that want.

L. E. Lily follows the practice of paying a commission to any of his employees who make a sale. He claims that this is a very effective method.

Lily, who carries a very large stock and keeps tab on it through a perpetual inventory system, is very enthusiastic over the results he has obtained from this department of his business.

One of Lily's men prides himself on his ability to sell something to every garage customer.

His accounting system shows that the equipment department pays him more for the space that it occupies than any other department of his business, including the new car sales section.

Sherman asked O. E. Schmidt, owner of the Reinzi Garage: "Do you find that your customers resent being asked to buy articles that they have not made a request for?"

Schmidt was unable to recall any instances where car owners had resented being asked to buy.

Immediately preceding adjournment a resolution was adopted supporting the merchandising movement of the A. E. A. and promising to cooperate with Sherman in every way possible.

Truck Makers' Conference Follows National Drawing

New York, Sept. 26—The annual members' meeting of the National Automobile Chamber of Commerce at which space is drawn for the New York and Chicago shows will be held at headquarters in this city Oct. 6. Prior to the luncheon, which will precede the space drawing, Magnus Alexander of the National Industrial Conference Board will address the members. A convention of truck manufacturers represented in the chamber will be held Oct. 7, at which the problems of that branch of the industry will be discussed.

NASH DISTRIBUTORS TO MEET

Kenosha, Wis., Sept. 26—Distributors representing the Nash Motors Co. will meet at the factory in Kenosha Oct. 5, 6 and 7 to attend the company's regular fall service meeting. The distributors will be accompanied by their respective service managers.

Southern California Sales Mount to New High Marks

Bankers Selling Seized Cars at Figures Considerably Below List Prices; May Affect Trade

LOS ANGELES, Sept. 24—The continuance of the demand in southern California for motor equipment surpasses understanding. In June, it was predicted the peak had been reached when the 10 counties passed the 5000 mark in registrations. This seemed to be borne out when July showed a slight decline, but August followed with a gain that not only passed the previous month's figures but was more than 100 in excess of June. September probably will fall slightly behind August, but indications are that the predicted slump has been postponed for at least a month.

Dealers and others closely identified with the trade have quit trying to guess business prospects. The air has been filled with a belief that business would have to get much worse, because of conditions in other parts of the country, but the time has not arrived, according to the figures. At the end of August there had been 33,681 new motor cars and trucks registered in southern California, as against 29,375 for the same period the year previous. August reported 5384 new passenger cars, of which 2333 were Fords, and 500 trucks and commercial cars, of which 220 were Fords.

There is no doubt but that if the strike in the oil fields that now is in force brings about an acute situation the automotive trade will feel the effects. Kern county, the heart of the oil district, is one of the most thoroughly motorized sections in the entire state and a complete tie-up in operations will paralyze all kinds of industry there. In Los Angeles county, the banks that have taken over a liberal quantity of both trucks and passenger cars, have begun selling them at far below the original list prices. It cannot be told at this time how serious will be the effect of this class of trade. Truck dealers are likely to feel it more than the passenger car dealers.

HIGHWAY BILL DELAYED

Washington, Sept. 24—No action will be taken on the highway appropriation bill until the House reconvenes Oct. 4. The House met Wednesday, but under the gentleman's agreement will take three-day recesses until October, when it will settle down to business. It is expected that differences between Senate and House bills will be smoothed out without delay because practically all highway construction dependent on Federal funds will be held up until these appropriations are available. Hope has not been abandoned for the establishment of a Federal highway commission, although it is known nothing along this line can be expected in a legislative way at this session.

N. A. C. C. Manager Proposes Price Readjustment Week

Would Have "Buying Week" Follow; Commends Washington Officials

NEW YORK, Sept. 26—Contributing to a symposium in which reviews of representatives of various industries, are given, a novel proposal for hastening the return of business to normal is made by Alfred Reeves, general manager of the United Automobile Chamber of Commerce.

"People must be convinced that prices have been stabilized," says Reeves." Why could we not have a great 'readjustment week' when everyone would readjust prices, to be followed by a great 'buying week' that would tend to speed up the wheels of commerce?

"The Administration at Washington is, I believe, doing everything possible to bring about these readjustments in orderly fashion. You cannot legislate yourself into heaven, however, and the country's situation was so bad that even so great a leadership and so great an array of men as we have at Washington at the present time, cannot bring the readjustments except at a slow and orderly rate.

"Let us have faith in our Washington officials until they prove unworthy.

"Let us take a greater interest in our local municipal affairs where much trouble is brewing because of extravagances.

"Let us have that abiding faith in the future of America that has always been the keynote of our progress, and above all, let us work."

Referring to taxation, Reeves says: "Instead of looking for new sources of revenue there is a general feeling that we should find new sources of economy." On the subject of taxation, his view, which is that of the automobile industry, is:

"Let us have a tariff that will produce a fair revenue but not one that will simply place the burden of the increase on the American public. This country with great productive capacity needs trade. We must expect to buy from foreign countries if we plan to sell to them."

WEEKS FAVORS FORD PROPOSITION

Washington, Sept. 24.—Negotiations for the purchase of the Muscle Shoals establishment by Henry Ford are still pending. W. B. Mayo, chief engineer of the Ford organization, conferred recently with Secretary of War Weeks and his advisers, but he was not authorized to submit a new proposition in behalf of the Detroit automobile manufacturer.

Mayo discussed the possibilities of developing the power plant in Alabama. There have been many protests to the War Department from farmers and others, but it is known that Secretary Weeks is disposed to take the Ford offer as the best proposition. The government cannot afford to operate the plant either independently or by a subsidy. It is reported that the offer submitted by a southern promoter had been considered, but a question had developed whether sufficient capital could be raised to make the necessary payment.

A report will be submitted to Ford at an early date, together with Mayo's recommendation. It is believed that Ford himself will conduct the final negotiations with the War Department.

Postoffice Clerks to Guide Motorists

Indianapolis, Sept. 25—Road maps, guides and information are to be supplied to the motoring public by a tourist bureau in the Indianapolis postoffice, opened under orders from Postmaster General Will Hays, which followed a suggestion to Postmaster Springsteen. "It is suggested that the postmaster or some designated clerk in each postoffice might, without serious loss of time in his regular work, so equip himself as to be able to give quick and reliable data in answer to inquiries concerning directions, etc., in addition to giving cheerful attention to the travelers' mail inquiries," says a letter from the postmaster general.

ASSOCIATION BACKS CONVENTION

Philadelphia, Sept. 24.—The Philadelphia Automobile Trade Assn. has endorsed the proposition for amending the state constitution through the calling of a constitutional convention. The automobile industry is particularly interested in this plan, because of its desires to see legislation enacted to provide funds for the continuation of the state roads construction work, when the present available money is exhausted at the end of the year.

At a meeting of the association's board of directors, a resolution was adopted favoring the holding of the convention and urging members of the automobile industries to vote in favor of the convention.

The Autocar Co., Ardmore Pa., is running large advertisements in the newspapers, calling on men and women voters to vote "yes" for the constitutional convention, reproducing that portion of the ballot to show how to mark it. The ballot to show how to mark it. The Lexington Motor Co., Philadelphia, is running advertisements along similar lines.

PLANNING MONTREAL SHOW

Montreal, Que. Sept. 26.—Preparations are being made for the Montreal Motor Show, which is the most comprehensive exhibition in Eastern Canada. In one sense it is more complete than the Toronto exhibition, in that it is held under one roof, whereas in Toronto the show is divided into three separate sections—passenger cars, trucks and accessories. There is a possibility of an additional show being held in Toronto in January or February.

Industry Has Couzens in Unemployment Conference

Unit Makers Declare Concessions Will Stabilize Products for Long Time on 1917 Basis

WASHINGTON, Sept. 24—Only one man directly connected with the automobile industry has been selected by the President as a member of the unemployment conference which will be held here beginning Sept. 26. James Couzens, Mayor of Detroit, former vice-president of the Ford Motor Co., has been named as a representative of the city and of the automobile industry. An effort will be made by the automobile trade and highway officials to show that the resumption of highway construction would alleviate unemployment conditions and at the same time improve the transportation facilities of the United States. It is hoped that Couzens and others interested in the automobile industry will keep this subject before the conference.

Secretary of Commerce Hoover stated that the selections were made to secure geographic representation as well as consideration of community interests. It was found important to include representatives of 50 trade groups and hold its size within workable limits.

The statistical information regarding unemployment has been prepared by the Economic Advisory Committee of the Department of Commerce. Secretary Hoover has been appointed by the President as chairman of the conference.

TWO BRITISH CARS REDUCED

London, Sept. 24.—The latest British car to reduce its price is the Lanchester Six rated at 40 horsepower. The chassis price has been cut from $11,000 (normal exchange) to $9,750. The decline in the price of American cars is averaging higher than the new price on British makes.

The 12 horsepower Rover, the design of which has been changed but ltle since the prewar days, has been reduced from $3,675 to $3,125 for the two seated model; from $3,775 to $3,250 for the touring car and, from $4,375 to $3,775 on the closed models.

NESCOB DESIGNING NEW CAR

St. Louis, Sept. 25—A new car is being designed by the Nescob Mumperow Motor Car Co. The new car will probably have a Weidely engine, Bosch electrical system, Muncie transmission and Salisbury axle. The bodies are four-passenger sport and two-passenger speedster. It is expected that the price will be around $2600.

GREATER READING FAIR SHOW

Reading, Pa., Sept. 24.—The automobile exhibit at the Greater Reading Fair covers about an acre of ground. More than 50 exhibitors are here. The placing of the exhibit cost more than $6,000 and the value of the cars is estimated at upwards of $600,000. Attendance has been averaging about 35,000 daily.

Service Movement's Growth Shown by New Associations

Public Is Given Protection Against Irresponsible Concerns in Pledges of Fast Growing Organizations

CHICAGO, Sept. 26—A recent news bulletin sent out by the N. A. C. C. states:

"Seven new automotive service associations have been formed during the past year with the aim of promoting the welfare of the car owner by raising the standards of repair work and by discouraging service stations that engage in unfair practices.

"The growth of motor transport to a point where over 9,000,000 vehicles are on the road, has called for a corresponding increase in the science of the care of these vehicles. Certain individual companies have developed an efficient service policy, but local cooperation of service men for the sake of maintaining standards is comparatively new.

"Service station men have found it desirable to have an association which will fight the irresponsible repairshop whose sole interest is to 'gyp' the public. The shop of unfair standards can make unnecessary repairs, use inferior parts and indulge in other practices immediately profitable, but in the long run damaging to the entire business. If any one service man protests against such practices by a rival he is likely to be accused of trade jealousy. A service association, however, can help protect the public and the good name of the trade.

"Service associations also make for efficiency in repairs. They permit a study of the local situation and the exchange of ideas on economical repair methods.

"The seven new associations formed this year are in Worcester and Springfield, Mass.; Syracuse and Buffalo, N. Y.; Hartford, Conn.; Pittsburgh, Pa., and Charlotte, N. C. Other associations already established are:

Automotive Service Assn. of Baltimore.

Automotive Service Assn. of Brooklyn.

Automotive Service Assn. of Denver.

Automotive Service Assn. of Indianapolis.

Northwest Automotive Service Assn. Minneapolis.

Automotive Service Assn. of Newark.

Automotive Service Assn. of New York.

Motor Maintenance Assn., Omaha.

Kings County Automotive Trades Assn., Seattle."

A. E. A. ACTIVITIES INCREASE

Chicago, Sept. 24—Activities at the headquarters of the Automotive Equipment Assn. have taken on an added zest since the establishment of the merchandising department under the directorship of Ray W. Sherman. As an example of the broad interest being aroused through the new work of the association, there are now on file more than 40 inquiries from non-members of the association asking to be given definite information on the solution to the problem of selling automobile accessories. Another piece of work that promises to be of great value to the automotive industry will be offered as soon as completed. This will consist of a report covering the volume of yearly business done by members of the association. The Board of Directors of the A. E. A. will hold its mid-convention meeting in Chicago Oct. 30.

Poet's Home to House Motorists

BERKELEY, Calif., Sept. 24—An automobile camping park is to be opened in Joaquin Miller's home place, in the hills back of Berkeley, if present plans of the Berkeley city council and the Oakland Park Board are carried out. At present, the widow of the poet of the Sierras and her daughter are occupying the two small cabins on the property, but most of it has been deeded to the state and city of Berkeley by the Miller family, on condition that it be preserved permanently as some sort of park to bear the name of Joaquin Miller. It is believed the most useful manner in which this can be done will be to convert it into a park for motorists.

N. A. C. C. INSURANCE PLAN PROGRESSES

New York, Sept. 26.—Considerable progress is being made by the insurance committee of the National Automobile Chamber of Commerce in its negotiations with the leading insurance companies looking toward reduced cost of insurance on motor vehicles. It is felt that only a negligible proportion of underwriting losses can be traced to construction features of cars.

Continued thefts of large numbers of cars in certain districts have been reflected in premiums which now have reached an almost prohibitive point. Measures for curtailing these thefts are having the active attention of car makers and underwriters. Rigid enforcement of laws proposed or already enacted, it is believed, would do much to meet this situation.

STUDEBAKER SANDWICHES

Birmingham, Ala., Sept. 24.—The Consolidated Motor Co. used a unique advertising scheme recently when one of its cars headed a circus parade and the elephants in the parade were converted into Studebaker sandwiches, a Consolidated banner hanging down the sides of each of the big animals. In addition to these "stunts," when the big show opened, a Consolidated car raced around the big arena and a Studebaker was placed on exhibition in the animal tent, where everybody could inspect it at close range.

Parts Reductions to Lower Price of Assembled Cars

Unit Makers Declare Concessions Will Stabilize Products for a Long Time on 1917 Basis

DETROIT, Sept. 26—Important price revisions among leading unit parts makers, announced to the industry in the past week and effective almost immediately, are expected to place the assembled car and truck business upon the firmest price foundation that it has known since 1917.

In the opinion of the unit makers, their concessions will be followed at once by reductions in the prices of assembled cars and trucks, and the price so announced will be absolutely stabilized for a long time to come. Car and truck makers whose present prices have anticipated the new concessions, will show a smaller reduction than in the case of products which have awaited definite action by the parts makers; but it is regarded as certain that there will be general revisions all along the line.

There is a feeling that the reductions in the assembled products will bring at least temporarily, an area of competition between the all-factory built and the assembled product, which will bring the industry as a whole immediately to a point where hesitancy in buying on the part of the public will be eradicated as a factor in withholding business.

In announcing the price revisions to the trade, the parts makers are doing so with the knowledge that comparison with the basis of prices in 1917 will show not only that they have again reached that level, but in many instances are actually below it. In return, the revision of prices by the assemblers is expected to show the buying public a similar favorable comparison, and restore buying confidence.

In fixing their new price schedules the parts makers have based them entirely upon present day material and labor prices and a production cost determined as accurately as possible on business which the reductions should bring about. The new prices will mean further heavy inventory losses, but these will be taken as necessary to restore confidence to the buying public.

It has ben taken for granted that a considerable time must elapse before sufficient business will have resulted to compensate for the inventory losses. This time will be the period of greatest trial for the industry. With it safely passed a firm business footing will have been established and that is the aim of the movement.

PORTLAND DEALERS ENJOY OUTING

Portland, Ore., Sept. 24—Portland automobile dealers and their wives, nearly 100 strong, enjoyed a dinner and dance at the Columbia Gorge hotel, Sept. 14. The event was under the direction of the Portland Automobile Dealers' Assn.

BUSINESS NOTES

Metals Coating Co. of America, manufacturer and distributor of the Schoop Metal Spraying Process, by means of which metallic coatings of any kind may be sprayed onto any surface, is now in full operation at its new plant, Philadelphia, having removed from its former Boston, Mass., and Woonsocket, R. I., locations.

Anderson Motor Co.—To continue its economical manufacturing in the south, where labor conditions are most favorable, and also to get full benefit of a metropolitan factory department with every facility to aid its northern distributors and dealers, the Anderson Motor Co. of Rock Hill, S. C., will open a wholesale sales division in New York City.

Tell-Tale Piston Ring Sales Agency, Philadelphia, has been opened as a direct factory branch of the St. Louis Piston Ring Corp. A full stock of Tell-Tale rings will be carried in all over-diameters and over-widths. The branch is under the management of N. Loewenthal.

Timken Roller Bearing Co.—A cut of 10 per cent in wages at the Columbus plant of the Timken Roller Bearing Co. was announced Sept. 16, to become effective Sept. 19. The cut affects practically everyone employed in the plant, as it applies to hourly, premium and piece work.

American Motors Export Co.—The first carload of steel for use in building the first unit of the American Motors Export Co.'s plant is now on its way to Jacksonville. Work on the plant will commence at once and the building will be rushed to completion.

Victor Bearings Co., Indianapolis, with a capital stock of $300,000, has taken over the properties of the Modern Die & Tool Co. of this city. The company will engage in the manufacture of bearings for automobiles, trucks, racing cars and aeroplanes.

Sales Managers' Department of the National Implement & Vehicle Assn. will act as host to the National Federation of Implement & Vehicle Dealers' Assn. at a luncheon in Hotel Sherman, Chicago, Oct. 6.

American Road Builders' Assn. will hold its next annual convention and Good Roads Show in Chicago, Jan. 17, 18, 19 and 20.

Dunkirk Axle Co., Buffalo, was sold at receiver's sale to Charles Capman of Syracuse for $133,000. The purchaser is a large creditor.

Adria Motor Car Co., which is preparing to open its new plant at Batavia, N. Y., has increased its capital stock from $1,000,000 to $5,000,000, this action having just been endorsed by the present stockholders.

Edmonds Auto Transportation Co., Edmonds, Wash., has been incorporated by R. O. Sorenson, L. E. McReynolds and H. T. Reister for $40,000.

Quaker City Rubber Co., Philadelphia, manufacturer of the Trusty Friend, Quaker cord, will move into its new modern Quaker building on Nov. 1.

Nashville Fair Races—During the Tennessee State Fair, Sept. 19, 20, 21, 22, 23, 24, the automobile races were an important event, also the exhibit of various models of cars.

Automotive Repairs, Inc., Seattle, Wash., has been incorporated by L. Heiberg, Mabel Heiberg and J. H. Joyce for $5,000.

Columbia Tire Corp., Portland, Ore., has bought an eight-acre tract to be used for a tire factory site. Officers of the company are R. A. Wurzburg, president; Lewis Wyman, treasurer and sales manager, and Kenneth C. Mohrhardt, secretary.

Gardner Motor Co., St. Louis, had shipments for the first six months of this year of 2084 cars and sales in July were 700 cars. Present shipments are approximately at the July rate.

Perfection Tire & Rubber Co.'s stock has been reduced from 1,500,000 shares of $10 par value to 150,000 shares of no par value, the rate of exchange being 10 shares of old for one of new.

Consolidated Distributors, Inc., receivers in equity, have been appointed for this company which manufactures automobile accessories in New York City and distributes them through 39 stores in various cities throughout the country. Liabilities were given as $2,500,000 and assets as $3,500,000.

American Hammered Piston Ring Co., Baltimore, Md., has sent George E. Bowdoin to Europe to look after some features of its export business. Bowdoin sailed from New York the latter part of September for Plymouth, England. On this particular trip he expects to spend about a month in Great Britain and on the continent.

Owen Tire & Rubber Co., Bedford, O., is considering a reorganization. Manton B. Scott has been appointed receiver. The assets of the company are given as $800,000, with liabilities of $200,000.

James Cunningham Son & Co., automobile manufacturer of Rochester, N. Y., during the past 10 days has noted an improvement in business and is planning on a production of 35 cars this month. Most of the machines are custom built. The company's 600 employees are working on a basis of 40 hours a week.

Star Wing Co., Chicago, manufacturer of gloss wing windshields, has made a second reduction in the price of its product. The reduction amounts to $2.50 on each of its three types of wings.

MICHIGAN HAS TITLE LAW

Detroit, Sept. 26—Michigan, following the example of Pennsylvania, New Jersey, Maryland, Indiana and Ohio, now has a law which requires not only that every car be registered, but that each owner must have from the secretary of state a certificate of title. This title must be obtained not later than July 1, 1922.

GRAMM-BERNSTEINS LOWER

Lima, O., Sept. 24—The Gramm-Bernstein Motor Truck Co. of this city has named the following prices, effective at once, on all Gramm-Bernstein Pioneer models listed here:

Model	Chassis Price	Completely Equipped
15—1½-ton	$1,900	$2,050
65—1½-ton	2,500	2,725
20—2 -ton	2,925	3,175
25—2½-ton	3,275	3,575
30—3 -ton	4,225	4,525
35—3½-ton	3,995	4,375
50—5 -ton	4,895	5,275

MATTHIESSEN TO AID HAYES

Washington, D. C., Sept. 24—Ralph H. Matthiessen, president of the Motor Haulage Co., New York, has been named to assist Post Master General Hayes in reorganizing the motor truck service of the Post Office Department. In his new work Matthiessen will have mail fleets in 271 cities in the United States under his charge. These fleets, totaling 3600 trucks, carry annual expenses of about $15,000,000. It is the plan of the department to install the most modern and efficient service possible for the mail trucks.

ORDINANCE LIMITS JITNEY BUSSES

Indianapolis, Sept. 26—Jitney busses, through an ordinance introduced in the city council, will be excluded from all streets on which street cars are operating and will be required to give bonds ranging from $10,000 to $20,000, and to pay a license fee ranging from $26 to $50 a year. There is every indication that the city council will pass the ordinance, several members of the council having made extensive investigations of the jitney bus and transportation problems in Kansas City, Des Moines and other places. Violation of the ordinance would carry a fine of $300 and imprisonment up to 180 days.

G. M. C. to Center Its Export Activities at Oshawa, Ont.

Cadillac and Truck to Be Only Exceptions to New Plan of Corporation

NEW YORK, Sept. 26—Manufacture of all export models, with the exception of the Cadillac car and the General Motors truck, will be concentrated by the General Motors Corp. at its Canadian plant at Oshawa, Ontario. It is stated that centering of such production at a single point will place one executive in charge of all export production with a better realization of export needs. Its purpose is to produce a line of cars more reliable and more thoroughly tested which, for these reasons, will be better fitted for foreign trade. Another purpose is to give greater flexibility to the manufacture of such cars, not only because of changes in the manufacturing program but because of detail necessary to meet export needs.

In connection with the concentration of foreign trade manufacturing in Canada, Paul Fitzpatrick who is now vice president in charge of operations for the General Motors Export Co., will be transferred from that organization and made assistant to Alfred P. Sloan, Jr., with duties pertaining to the transfer of operations to Oshawa and the study of all problems incident to them.

P. S. Steenstrup, vice president in charge of sales, will exercise full authority in the export organization, subject to the president, and all personnel heretofore reporting to Fitzpatrick will report to Steenstrup.

MOTOR WHEEL CORP. EXPANDS

Detroit, Sept. 24—Motor Wheel Corp. at Lansing will push forward at once new building plans which will permit consolidation of several of its units.

Among the construction details is a new rim plant to take care of contemplated increase requiring additional steel rim and steel felloe output. This will be in operation before the first of the year. The hub shops of the Prudden auto wheel plants will be consolidated into a modern hub machine shop of greatly increased capacity. The main office of the company at the Prudden factory will be doubled in size and all the Lansing offices will be consolidated there.

The company will erect several new buildings and increase its railroad facilities at the woodworking plants in Memphis.

G. M. C. NAMES DIVIDENDS

New York, Sept. 22—Directors of the General Motors Corp., at a meeting here this afternoon, declared a dividend of 25 cents a share on the common stock, $1.50 on the 6 per cent preferred, $1.50 on the 6 per cent debentures and $1.75 on the 7 per cent debentures, payable Nov. 1.

Trade Association Heads Ask Second Conference

First Meeting of Indiana Secretaries So Successful That It May Become Established Practice

INDIANAPOLIS, Sept. 25.—Secretaries of local automotive trade associations in Indiana met here Sept. 20 for a conference. The meeting was arranged by L. M. Shaw, secretary-manager of the Indiana Automotive Trade Association. The purpose of the conference, as explained by Shaw, was to provide the secretaries with first hand detailed information for the solution of their secretarial problems. The program, as originally announced, was pretty well covered in the one day, making unnecessary a second day. Harry G. Moock, general manager of the National Automobile Dealers' Assn. unable to be present, sent a message as follows:

"Congratulations on your effort in bringing together the local secretaries of the trade associations in your state. Your meetng is the first of its kind ever held within the industry to our knowledge and we are certain it will be productive of results beyond your expectations. As certain activity now calls for more courage, than is required of constituent members, on the part of secretaries, I regret exceedingly my inability to be present. Best wishes."

Whatever may be the results of this first gathering, the secretaries attending became so enthusiastic at the great possibiltes of the conference, that they unanimously voted for another conference, Oct. 18. Each of the men present will use his personal efforts to interest the secretaries who were not present at the first conference.

J. F. Frohbietor, secretary of the Evansville Dealers' Club, Clem McConaha, secretary of the Wayne County Auto Trade Assn., and C. V. Bender, manager of the Muncie Auto Trade Assn., were the leaders of the program. Definite and detailed information presented covered the following subjects: arrangement of meeting programs, interesting and bringing in the accessory and battery men; relation of newspaper and association activities; how Muncie dealers were saved $2500 in their newspaper advertising cost; how Wayne Co. Auto Trade Assn. has won recognition from the Chamber of Commerce as one of the live wire civic business groups; handling of small town automobile shows, and many other important questions.

ALL-AMERICAN FACTORY SALE

Chicago, Sept. 24—The real estate belonging to the All-American Truck Co. of this city, which has been in the hands of a receiver for the past year, will be sold at public auction Sept. 27. All other property of the company, including equipment, materials, etc., was sold to several hundred bidders at auction last August. The first sale produced about $100,000.

CONCERNING MEN YOU KNOW

R. A. Wilson, production manager of the Leach Motor Car Co., Los Angeles, is in eastern manufacturing centers on an extensive buying trip. Raw materials are being purchased, as well as a large amount of machinery for the factory. Wilson plans to visit automobile manufacturing centers at Detroit, Indianapolis, Rochester and Buffalo before returning, about Nov. 1.

Frank E. Knickerbocker, formerly in charge of the Flint branch of Samson Tractor Co., is in charge of a new factory branch of Oldsmobile in Lansing, Mich. From this branch also J. W. Rapley will handle general distribution in Michigan.

L. K. Rittenhouse has succeeded L. I. Ris as eastern district manager of The Star Rubber Co., Inc.; offices are located in New York City. Rittenhouse has had 14 years of actual experience in the tire industry as salesman, branch and district managers with Diamond, Goodrich and Firestone companies.

George B. Bell has been placed in charge of the Department of Agricultural Implements and Vehicles of the National Implement & Vehicle Assn.

Fred Wilson, the newly appointed sales manager of the Stutz Motor Car Company of America, Inc., has already assumed his duties at the Indianapolis plant.

Fred Wilson, Indianapolis, has been named general sales manager of the Stutz Motor Car Co. of America, Inc., and has assumed his duties.

Edward S. Jordan, president of the Jordan Motor Car Co. of Cleveland, has accepted an invitation to speak at the convention of the Indiana Automotive Trade Assn., Nov. 16 and 17.

E. G. Morse, vice-president and general manager of the John Willys Export Corp., has been named sales manager of C. H. Wills & Co., Marysville, Mich. Morse was formerly vice-president and general sales manager of Chalmers, and previously was with the National Cash Register, E. R. Thomas Co., Buffalo, and Hudson Motor Car Co.

Walter W. Biddick, field secretary for the California Automobile Trade Assn., has just completed organizing the Oroville unit of the state-wide organization. The following officers were elected: Walter J. Sharkey, president, C. D. Records, vice-president, George Chaffn, treasurer, Robert Duncan, secretary-maanger.

Ezra W. Clark, advertising manager of the Clark Equipment Co., Buchanan, Mich., has been elected chairman of the executive committee of the advertising managers' council of the Motor & Accessory Mfgrs. Assn. He succeeds E. C. Tibbets, formerly advertising manager of the B. F. Goodrich Rubber Co.

Seiberling Is Still After Links for His Rubber Chain

Cleveland, Sept. 26—It is understood here that F. A. Seiberling, former president of the Goodyear Tire & Rubber Co., has resumed his negotiations for the purchase of the plant of the Republic Rubber Co. of Youngstown, which is now in the hands of a receiver. Some time ago, it was stated, Seiberling made an offer of $2,500,000 for the factory. This proposal is said to have been satisfactory to the stockholders but the creditors did not think the sum adequate. Since that time a new creditors' committee has been named.

Seiberling recently visited the plant of the Portage Tire & Rubber Co. at Barberton, which is in bankruptcy. This would seem to lend additional weight to the report that he proposes to establish a chain of rubber plants through the middle west.

LINCOLN CAR NEARS TOP

Detroit, Sept. 24—Lincoln Motor Car Co., through the growth in its business in the past nine months, has climbed to twenty-fourth preferred position at the national shows to be held in New York and Chicago in 1922. This statement was made at a convention of Lincoln distributors in Detroit, at which sales achievements of the year and plans for better business in 1922 were discussed.

September with the Lincoln company has been its greatest month, 90 cars being shipped in the first week and 400 being set as the mark for the month's total production. October output will top this, officials declared.

New York, Chicago, Philadelphia and California cities were shown to be the particular high spots in sales, with many smaller cities, notably Dayton, O., Springfield, Mass., and Grand Rapids, Mich., making splendid showings. Business in the south has reached new high marks, indicating a growth in popularity of high priced cars in that territory.

Distributorships in Lincoln cars were shown to have increased from 15 to 60 in a year, with 150 sales points now established.

Addresses were made at a dinner to the distributors by Isaac F. Marcossom, journalist; Henry M. Leland, president of Lincoln, and R. C. Getsinger, general salesmanager.

Senate Committee Lays Tax on Wholesale Selling Price

Washington, Sept. 24.—The Senate finance committee has rescinded its earlier action and decided that manufacturers whose products are subject to excise taxes levied in the revenue bill may continue to compute their tax on the wholesale selling price regardless of the retail business they do. This was one of the points in the bill as passed by the House to which the tax committee of the National Automobile Chamber of Commerce took exception. If the change had been made taxation in this respect would have reverted to the status of 1917.

SHOW AT LITTLE ROCK FAIR

Little Rock, Ark., Sept. 24—Five members of the Little Rock Automobile Dealers' Assn., at a recent meeting held here, were appointed to plan the automobile show which will be a feature of the Arkansas State Fair and Exposition at the City Park, Nov. 11-19. The association voted to stage the automobile show at the fair after abandoning a plan to tour all the cities and towns within a radius of 25 miles of Little Rock. The automobile committee includes: R. B. Black, A. L. Woolfolk, L. E. Whutemore, C. H. Faulhaber and A. W. Parks, secretary of the association.

IN THE RETAIL FIELD

J. A. Pierpont, who has been president for the last six years of the B. L. P. Motor Co., handling Premier cars in Philadelphia, has been appointed distributor in the Philadelphia territory of Auburn cars and has resigned from the B. L. P. organization. Pierpont will head the new company, which will be known as the Pierpont Motor Co., and which will open a sales and service building immediately. H. E. Grant will be sales manager and Howard Brooks service manager.

Gordon R. Cowie and Geo. Frellson, Columbia, Tenn., have sold their interest in the Fry-Cowie Motor Co., and in the future the name of the concern will be the William Fry Motor Co. Recently the Fry-Cowie Motor Co. secured the agency for 15 counties for the Dodge car.

C. H. Wills & Co. is commencing to open agencies in Illinois. J. G. Shepherd has been appointed distributor at Rockford. He will have authority over Winnebago and Rock Island counties.

Palace Garage has been purchased by Thomas C. Wilson, operator of the Birmingham Auto School, and W. M. Wray. This is the largest garage in Birmingham. It has three floors for storing cars 140 by 200 ft.

Birmingham Automobile Painting Co. has just completed its new home. All parts of the building are dust-proof and the finishing room is finished in white enamel and has the very latest equipment.

Garner Goodbread has purchased the Pippin Garage, Ozark, Okla., and has begun a general overhauling of the establishment. He will handle a complete line of automobile accessories and will add a tire department.

Pryor Motor Co., Hudson-Essex distributor for Birmingham, will move to new quarters this week. The new location gives this concern larger quarters for its shop and repair department and affords an ideal display room.

Edwards-Hanna Motor Co., Jacksonville, Fla., has a capital stock of $50,000. It will begin business with $25,000 of this amount paid in. The officers are: T. A. Hanna, president, Aubrey Edwards, vice-president and general manager, Kennon Bowling, secretary and treasurer, and Frank Stevens, assistant general manager.

Auto Service Co., Jacksonville, Fla., has been capitalized for $4000, all of which is paid in. M. T. Abbott, Jr., is president and treasurer, Wheeler Nolan, vice-president, and M. F. Wood secretary.

Daniels Motor Co., Reading, Pa., has announced that it will build a sales and service station in Philadelphia to cost $500,000.

Cooperative Buying—Automobile dealers and service men of Geneva, N. Y., have formed an organization to promote cooperative buying and encourage cash business or periodical settlement of accounts. The new organization's first officers are B. L. Adams, president, David Moore, vice-president, M. B. Grubb, secretary, and M. J. O'Malley, treasurer.

California Premier State With Three Speed Courses

San Francisco, Sept. 30—California is now the premier state in the Union in automobile racing facilities, according to E. F. Cheffins, official representative of the contest board of the American Automobile Assn., who is here on business connected with the Cotati Bowl and other speedways. There are now three fast speedways in California—two 1¼-mile tracks, one at Cotati and one at Los Angeles, and the mile track at Fresno. Cotati holds the world's speedway record, Eddie Hearne having averaged 110 m.p.h. in the recent 150-mile race which opened that bowl recently under A. A. A. rules.

Fresno has applied through the California State Automobile Assn., which is affiliated with the national organization, for an A. A. A. permit for a 150-mile race on Oct. 1, with total prizes of $16,000. Hanford, Calif., which has a fast dirt track, has asked for a permit for races Sept. 23-24.

ONE DEALER IN COUNTY

Columbia, S. C., Sept. 30—Six counties of this state have no motorcycles, according to registration figures compiled by the state highway department. The six counties reporting no motorcycles are Bamberg, Harmwell, Calhoun, Jasper, McCormick and York. Up to Aug. 31 but one automobile dealer was registered in Berkeley county.

FORM WORLD-WIDE ORGANIZATION

New York, Sept. 30—The World's Board of Aeronautical Commissioners, Inc. now consists of 98 commissioners in 81 countries and colonies of the world, and when the list is completed, there will be over 125 commissioners in about 100 countries and colonies.

The officers say that in the United States prominent and influential business men are accepting the position of chairman of the board for the state, county and city in which they reside. To date the acceptances indicate that when the organization is completed there will be 48 state chairmen, 2800 sectional and 12,000 local chairmen.

The local chairmen will have charge of a campaign for members, and if each one secures 10 members it will make the membership in the United States over 100,000.

The above plan carried out throughout the world would make a working staff of 100,000, and should produce 1,000,000 members.

NATIONAL TRACTOR SHOW IN MINNEAPOLIS

Chicago, Sept. 30—The Seventh National Tractor Show and Educational Exposition will be held Jan. 30 to Feb. 4 inclusive, on the Minnesota State Fair grounds, Minneapolis. For the present, the show management will make its home in the offices of the National Implement & Vehicle Assn., 72 West Adams street, Chicago.

AUGUST PAY ROLLS DECREASE

Washington, Sept. 30—Analysis of reports received by the Bureau of Labor Statistics, concerning the volumn of employment in August, shows that the per capita earnings in the automobile trade increased 2.3 per cent, as compared with July. However, comparisons of employment in 52 identical establishments in the automobile business show that for a period of one week the number on the pay roll in August, 1920, was 129,194, as compared with 82,946 for August of this year, respresenting a decrease of 35.8 per cent. The amount of the pay roll in August decreased 39.2 per cent, as the 52 establishments reported a pay roll of $4,549,257 in August, 1920, and $2,764,995 in August, 1921.

Texas Automobile Dealers to Dot State with 11 Shows

Intensive Selling Campaign to Follow Closely Benefits Derived From Local Expositions

DALLAS, Tex., Sept. 26.—If automobile shows will aid in boosting business in Texas this fall and winter, distributors and retailers of automobiles, accessories, tires, trucks and trailers are going to keep business going through the "lazy months."

Texas dealers are of the opinion that one of the best ways to interest buyers in automobiles and kindred lines is to keep the latest products well displayed and have them demonstrated to a degree that will command interest and attention. They have arranged for a series of shows in every part of the state during the next 60 days. At these shows the people will be acquainted with the advantages of owning automobiles, trucks and tractors.

The automobile show at Amarillo will be held the latter part of this month. Here the people from the Panhandle will be given for seven days an opportunity to see what the automobile world has to offer and at what price and terms. The show at San Angelo will also be held the latter part of the month. Denison will hold a show during the present month, and probably Wichita Falls will have one the first week in October.

The first big automobile show, and probably the most complete to be held in Texas this fall, will be that at the State Fair of Texas, Oct. 8 to 23, at Dallas. This will be of international scope, because Mexico will be here for automobiles and trucks, also trailers and tractors.

The next big automobile show in Texas will be held at Waco by the dealers of central Texas in connection with distributors during the life of the Cotton Palace—about 15 days.

Following the Waco show and coming early in November will be the big exhibition of the south Texas dealers at Houston during the carnival week. R. S. Kerr is in charge of the arrangements.

After the Houston show there will be one at Beaumont in connection with the east Texas fair. This will be about the middle of November.

While not in Texas, Shreveport is on the state line and many east Texas dealers will have exhibits at the fair there late in November. The arrangements for the Shreveport show have not been completed.

It is reported that San Antonio dealers will join with those of southwest Texas and stage a big show during November. El Paso will probably have her fall show during October. Dealers of New Mexico and Arizona will follow up these shows with intensive selling campaigns and they expect to conclude the year with the biggest business in their history.

The Readers' Clearing House

Questions & Answers

CONDUCTED BY WM. H. HUNT

LIQUID FUELS ONLY ARE SATISFACTORY

Q—Are there any cars on the market at the present time using coal gas, hydrogen or any other gas as fuel?

2—If so, can you give us the manufacturer's address?

3—If possible, publish an illustration of the mixing or carbureting devices used.

4—Have any of these fuels proven satisfactory?—C. L. Brown, Jr., Pittsburgh, Pennsylvania.

1—No. During the war illuminating gas was used on a few cars in England. The containers consisted of gas bags suspended along the top. Any car can be operated on this fuel.

2—This information is not available.

3—We have no illustration of the devices used, as the expedient was temporary.

4—Any of the foregoing fuels are satisfactory for stationary engines or engines designed to operate at a constant speed. The principal drawback to their use on motor vehicles is that they require enormous space for storage. It is true that they could be compressed into tanks but this would raise their cost to a prohibitive figure.

WANT TO BUILD A HOME-MADE RECTIFIER

Q—Publish drawing showing the internal connections of a 6 amp., 75 volt. Tungar battery charging outfit.

2—Give size and amount of wire necessary.

3—Give thickness of iron core. It is our intention to buy the bulb from our supply house and construct the balance of the outfit ourselves.

4—If possible, also give size of wire of the 5.3 amp., 7½ to 15 volt Tungar.—Hons Electric Auto Co., San Francisco.

1—See Fig. 1.

2, 3 and 4—This data is not available. There is a method of connecting these bulbs directly to the lines without the use of a transformer. Information concerning plans where this data can be secured will be supplied upon request.

MISCELLANEOUS QUESTIONS ON LIGHTING

Q—When two lamps are wired in series, why is it that one burns brighter than the other?

2—Why is it that when head lamps are turned on in the dim position and one is removed the other one gets brighter?

3—How is a Ford coil tested and how can I tell exactly which one is grounded?—M. L. Haynes, Stonewall, W. Va.

1—Probably a difference in the lamps. If one should be of the ordinary exhausted type while the other is of the nitrogen-filled tungsten filament variety, the latter would, of course, burn much brighter. Another cause is the difference in age of the two bulbs. Still another cause might be an error in labeling at the time of manufacture.

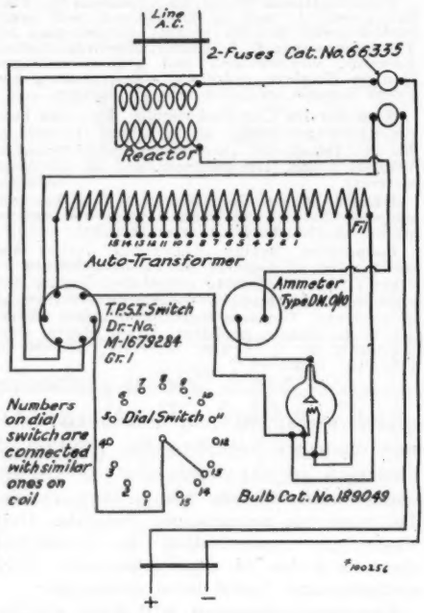


Fig. 1—Windings and connections of single bulb type Tungar rectifier

2—Only enough current can pass the dimmer resistance to make the bulbs burn dim. When one of them is removed all of the current is available for the other.

3—Assuming that you mean the field windings of the magneto, the only way in which you can be sure which one of these is grounded is to disconnect all of them all the way round and test each separately by touching the test heads from a battery or a 110-volt circuit, to one end of each of the windings, and the other end to the metal of the frame. If the test lamp lights, a ground is indicated.

ARMATURE DIAGRAM OF WESTINGHOUSE GENERATOR

Q—Can you furnish a diagram of the armature winding of the Westinghouse generator used on the 1916 Lexington car? The armature has 21 slots and 41 commutator segments. The serial numbers marked on the generator are S252128 and 5-17.

2—Can you inform us where we can secure the specifications on all generators and starting motors used on cars? What we want is a book showing the wiring diagram of all armatures and giving complete information as to the wire size, pitch, etc.—Exide Battery Station, Lexington, Nebr.

1—This generator is designated as frame No. 400R. The diagram of the winding is shown in Fig. 2.

2—The book may be procured from the U. P. C. Book Co., 239 W. 39th St., New York.

WANTS TO SPEED UP PAIGE CAR

Q—After driving 20,000 miles, should the valve stems and guides be worn enough to cause missing at extreme low speed? The car misses and jerks at 5 m.p.h. or less, and the carbureter cannot be adjusted to overcome it. Timing is all right.

2—It is desirous to obtain the highest speed possible from this car without altering the gear ratio. Suggest all that should be done to obtain the most in speed.

3—Would a 1½-in. carbureter be better than the 1¼-in. now in use?

4—Will the vacuum tank draw gasoline fast enough for continued high-speed driving?

5—What causes speed to drop after one-half mile with wide-open throttle?

6—If the block is reground and fitted with DeLuxe pistons, approximately how much would this change alone increase the speed?

7—If the block is reground, would you advise planing off the head to increase

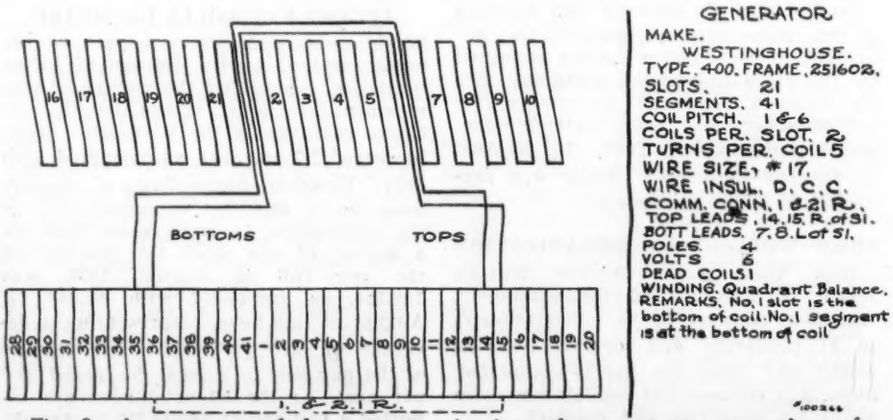

16 17 18 19 20 21 2 3 4 5 7 8 9 10
BOTTOMS
TOPS
28 29 30 31 32 33 34 35 36 37 38 39 40 41 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
1 & 2, 1 R.
GENERATOR
MAKE. WESTINGHOUSE.
TYPE. 400. FRAME. 251602.
SLOTS. 21
SEGMENTS. 41
COIL PITCH. 1 & 6
COILS PER. SLOT. 2
TURNS PER. COIL 5
WIRE SIZE, # 17.
WIRE INSUL. D. C. C.
COMM. CONN. 1 & 21 R.
TOP LEADS. 14, 15, R. of 31.
BOTT LEADS. 7, 8. Lot 31.
POLES. 4
VOLTS 6
DEAD COILS 1
WINDING. Quadrant Balance.
REMARKS. No. 1 slot is the bottom of coil. No. 1 segment is at the bottom of coil

Fig. 2—Arrangement of the armature circuits and commutator connections of Westinghouse generator, frame number 400

compression for more power and speed? If so, how much should be planed off?

8—Would 34 by 4 cord tires increase or decrease the speed over the 35 by 4½ fabric tires now on?

9—After we have carried out all the suggestions you can make for increasing the speed and retaining the standard gear ratio of 4.35 to 1, what would be the maximum speed that could be obtained on a straight, level cement road?—F. A. Work, Tiffin, Ia.

1—No. The valves and guides should not be badly worn in this distance. It is probable that the wear is in the pistons and cylinders, so that the compression is not quite up to normal. We would suggest that you let the carbureter alone and put your attention on the spark plug gaps. On general principles these should be set close for high speed work and rather wide for low speed. The missing and jerking complained of can usually be traced to poor seating valves or too close spark plug gaps.

2—Installing light weight pistons and lightening up the connecting rods from a point about 2 in. from the crankpin center upward, will result in more speed. If there is sufficient stock to permit reaming out the valve ports and installing larger valves, this will also help.

3—The installation of the larger carbureter will not help much unless the valves and intake ports are also increased in size. If the last is done at all, it must be done with exceeding care, as it is quite possible there is not sufficient stock between the ports and the waterjacket to permit of enlarging the ports to a sufficient size.

4—As a rule, the vacuum tank will keep up with the demand; however, in some cases the stock size is of insufficient capacity and should be replaced with the larger size. When this is done, it is also well to increase the size of the pipe line from the gasoline tank to the vacuum tank.

5—This is probably caused by undue heating. If the cooling system is of insufficient capacity, of course, radiation will not be rapid enough to hold the engine at the most efficient temperature. On the other hand, there have been cases where the cooling system was too efficient and at high speeds kept the engine too cold.

6—Possibly 5 m.p.h.

7—Increasing the compression will, of course, result in more power and better acceleration. We would recommend that not over ⅛ in. be taken off at a time. This is a question of "cut and try."

8—The 34 by 4 cord tires would be faster if they were maintained at the pressure of a fabric tire of the same size.

9—Besides the foregoing, there are so many factors entering into this question that it is impossible to make even a close estimate.

The Readers' Clearing House

THIS department is conducted to assist Dealers, Service Stations, Garagemen and their Mechanics in the solution of their repair and service problems.

In addressing this department readers are requested to give the firm name and address. Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been asked by someone else and these are answered by reference to previous issues. MOTOR AGE reserves the right to answer the query by personal letter or through these columns.

Emergency inquiries will be replied to by letter or telegram.

Addresses of business firms will not be published in this department, but will be supplied by letter.

WIRING DIAGRAM OF SAXON DUPLEX 1921 CAR

Q—Publish a wiring diagram of the 1921 Saxon Duplex car.—S. Raymond Keith, Boston, Mass.

See Fig. 3.

USING ENGINE AS BRAKE

Q—Referring to the Sept. 1 issue of MOTOR AGE, page 37, answer No. 6 to "Reader Desires to Know a Number of Things," last paragraph, you say "if it is desired to use the engine as a brake, engage the low gear, cut off the ignition and open the throttle to its limit." Why, to its limit? Why not a closed or a reasonably opened throttle?—J. C. Hartleigh, St. Louis Mo.

When the engine is used as a brake, the effect is as though it were an air compressor, consequently, the more air that can be admitted to it, the greater will be the compressor action and hence the greater the brake action. It is plain to be seen that if the intake manifold were blocked off completely there would be practically no brake action, as what should ordinarily be compression, will be about balanced by the vacuum. To obtain the most decided compressor effect, the throttle should be opened wide, admitting all the air possible.

GASOLINE MILEAGE OF H. C. S.

Q—What mileage per gallon of gas is it possible to get from an open model H. C. S. car under the most favorable conditions?—W. H. Stellner, Danville, Ill.

The manufacturers claim a consumption of a gallon to 22 4/10 miles.

METHODS OF REPAIRING SCORED CYLINDERS

Q—Advise us of the latest practical method of repairing scored cylinder blocks.—The Texas Co., Parks, Tex.

The silver-nickel alloy process has proven entirely satisfactory and successful. The names of the concerns controlling the process are being supplied by mail.

POWER CURVE OF LIBERTY SIX AND DORT ENGINES

Q—Publish the power curve of the Liberty Six and also the Dort engines.—Byron W. Myers, Up-to-Date Tire & Battery Shop, Goodland, Kan.

See Figs. 4 and 5. The curve shown in Fig. 5, that of the Liberty Six engine, is estimated only, the estimate being based on the manufacturer's claim of 53 hp. at 2500 r.p.m.

The rest of your query has been replied to by mail.

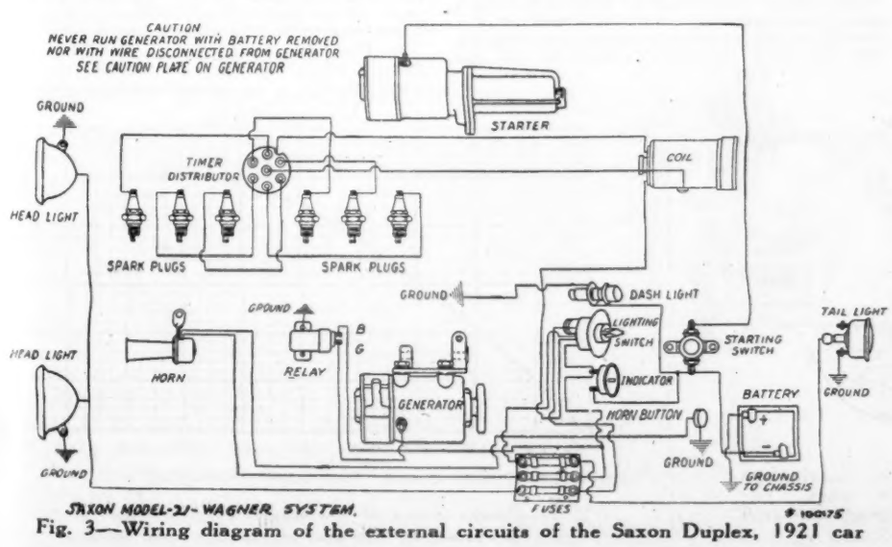


Fig. 3—Wiring diagram of the external circuits of the Saxon Duplex, 1921 car

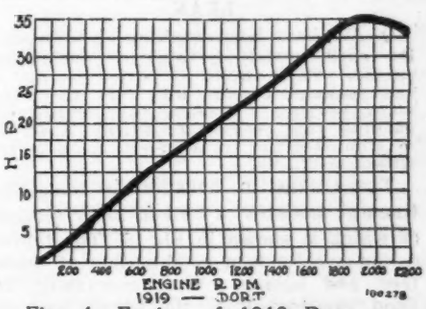


Fig. 4—Engine of 1919 Dort car develops 35 hp. at 1900—2000 r.p.m.

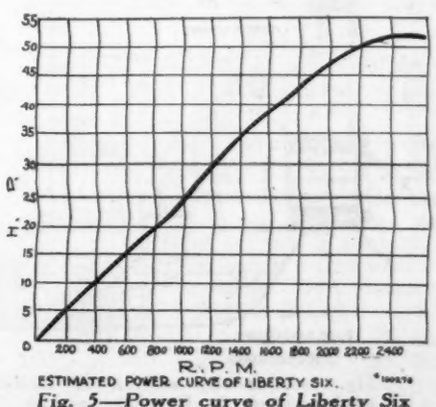


Fig. 5—Power curve of Liberty Six engine as calculated from bore, stroke and speed

ENGINES

PERSISTENT KNOCK IN NO. 1 CONNECTING ROD

Q—What would cause a knock in the No. 1 connecting rod on a 1920 Buick? This car developed the knock shortly after it was delivered. The rod can be adjusted up so that it will not knock for a short time, but it comes back within a few days. We have put in new timing gears, new piston and rings and wrist pin, but without any success. We are figuring on trying a new connecting rod. The crankshaft seems to be alright.

2—What kind of a knock will a misalignment of the connecting rod make?—Geo. L. Lamn, International Falls, Minn.

1—We believe this trouble to be due to a sprung rod. The proper procedure is to remove the connecting rod and piston and line them up on an aligning jig, if one is available. Another method is to disassemble the rod and piston and inspect the former with the aid of two plain arbors. These should be about 18 in. long, and made so that they will fit the crank pin bearing and the upper end of the rod. With them in place, the extreme length will so exaggerate any twist of the rod that it will be easily apparent. The proper remedy, of course, is to spring the rod until the centers of the two arbors are in perfect alignment. This corrects a twist. If the rod is sprung sidewise the centers of the arbors will not be the same distance apart on both ends.

2—The rap of a sprung rod becomes audible at speeds of 18 m.p.h., or over, and sounds something like the knock caused by a loose wrist pin.

ENGINE HAS BAD REAR BEARING LEAK

Q—We have been working on a Republic truck, model 11, using a Continental engine. The owner is experiencing a bad leakage of the oil from the rear main bearing. Explain the method of packing this bearing or fitting it so as to eliminate the trouble?—R. S. McCarty, Kilmarnock, Va.

The engine in question is the Continental model N, a broken away section of which is shown in Fig. 6. The lubrication system is a combination of force feed and splash. With everything in good working order the pump delivers oil to the main bearings at a pressure of about four pounds. Wear in either the pump or the bearings will cause this pressure to fall.

Referring to Fig. 6 points X & Y; X is an oil slinging flange integral with the crankshaft and has the function of throwing the excess oil into a recess with the interior of the crankcase.

The arrangement contemplates that the oil will be thrown from the oil slinger by centrifugal force, collected in the recess and returned to the crankcase through the duct Y. Many mechanics make the error of packing the recess with felt or wick packing with the result that the communicating hole at the bottom is plugged up.

A secondary effect is that the felt or other packing, through the force of capillary attraction conducts the oil from the recess to the outside of the bearing where it is thrown off by the crankshaft into the bell housing which surrounds the flywheel. This, of course, results in waste.

Beside the oil slinger, another provision designed to prevent oil leakage is a hole drilled half in the crankcase and half in the bearing cap into which wick packing is compressed at the time of assembly. Looseness in the rear main bearing will cause a heavy flood of oil to be delivered to it which, possibly, the slinger recess and duct cannot return to the crankcase rapidly enough. We would suggest that this point be carefully checked and the bearings taken up snugly, if necessary.

Of course, the recess and the duct should be examined to see that they are free of sediment and providing a clear path for the return of the oil.

ENGINE HAS SPRUNG CRANKSHAFT

Q—We have a Saxon model Y.18.T, engine number S4T 42649 which has a knock in the timing gears. We think the knock is caused by the front end of the crankshaft being sprung so that it throws the timing gears closer into mesh than they should be—about one-third the way around. The gears seem to run in mesh all right—all but about one-third the way. There they run so heavy in mesh that you can see where the top of the teeth on the camshaft gears are wearing on the gear on the crankshaft. If the crankshaft is sprung, would it be best to have it straightened or buy a new one? Where could we have it straightened? Do you think we could put enough shims above the top part of the main bearings so that the timing gears would not run too close in mesh? Would that be as good as having the crankshaft straightened? How much clearance should there be between the timing gears?—H. S. Williams, La Plata, Mo.

We believe you are correct in your conclusion that the crankshaft is sprung. It doubtless can be straightened by any first class machine works. We would suggest that it be sent to the Stafford Machine Works, 22d and Campbell Sts., Kansas City, Mo. This concern will advise you whether or not the straightening would be a success. If not, of course, the only alternative is to replace the shaft with a new one. We would not advise attempting to shim the top half of the main bearing, for the reason that unless all main bearings are shimmed equally the shaft will be sprung out of alignment. Although we have no definite figures on the proper clearance between the crankshaft and camshaft gears, we should say that it should be in the neighborhood of .003 in.

MAKING RACING CAR OF F. B. CHEVROLET

Q—We are rebuilding a 1920 model F. B. Chevrolet into a half mile dirt track racing car and would like to get the following information. Approximately what r.m.p. engine speed should we be able to get from this engine after doing the following: lightening each connecting rod nine ounces by dressing it down for its full length and also lightening the cap, putting in wrist pins 1¼ ounces lighter than the original stock pins, installing high speed camshaft, doubling the capacity of the oil pump and oil leads, putting on a high tension magneto instead of battery ingnition, lightening the flywheel 10¾ lbs, (cut from the rim) enlarging valve ports, both intake and exhaust from 1 5/16 in. inside measurement to 1 5/8 in., putting in 1 13/16 in. tungsten valves in place of the 1½ in. stock valves, enlarging the inlet manifold to 1⅝ in., installing 1½ in. Miller carbureter, and enlarging exhaust port 3/16 in.? Also about what brake horsepower should this develop?

2—Publish original power curve of this engine.

3—We have a set of new Dodge 32 by 3½ in. wire wheels that have not been uncrated and we would like to know if they can be used on the Chevrolet F. B. hub. If we have to have them re-hubbed, what should be the approximate cost?

4—We have been able to get 51 m.p.h. from a stock touring car geared 4¼ to 1, with 33 by 4 in. wood wheels. About

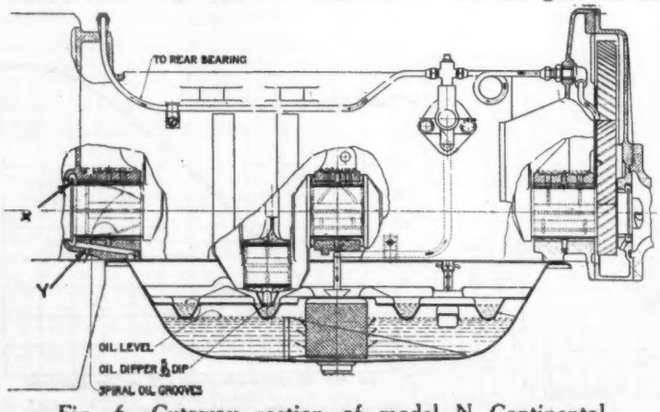


Fig. 6—Cutaway section of model N Continental engine used in Republic model 11X truck. The method of preventing oil leakage through the rear main bearing is shown at points X and Y

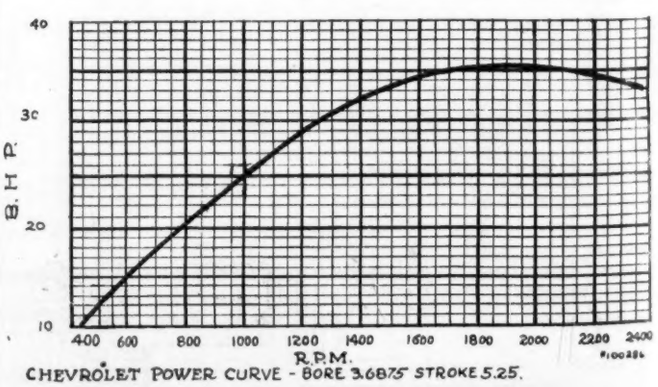


Fig 7—Power curve of the model FB Chevrolet engine as shown by the manufacturer's blue print

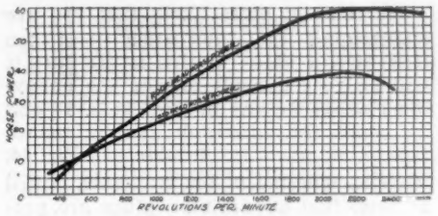


Fig 8—Comparative power curves of the Dodge Brothers engine—lower curve, with stock head—upper curve, with 16-valve head

what should we be able to get with the wheelbase shortened 19 in., engine lowered 3 in., engine moved back 6 in., stream line body, 32 by 3½ in. wire wheels, cord tires, same gear ratio after doing above work?

5—Do you advise higher gear ratio for ½ or ⅝ mile dirt track work or not? If higher how much?—B. H. Craig, Abilene, Tex.

1—As shown by the power curve in Fig. 7, the stock engine developed 30 h.p. at 2000 r.m.p. The power begins to fall off at 2200, decreasing materially at a speed of 2400 r.p.m. In view of this, we estimate that the changes will increase the r.m.p. to possibly 2600. The estimate shows an increase to about 40 h.p. at this speed.

2—See Fig. 7.

3—Your Dodge wheels cannot be used on the Chevrolet. Rehubbing these wheels would be an expensive job. It would be better to write to the manufacturers of them and arrange an exchange, paying a reasonable fee for this service.

POWER CURVE OF LINCOLN ENGINE

Q—Publish power curve of the Lincoln five-passenger phaeton; also, the maximum number of engine revolutions claimed by the company.—O. F. Rehm, Louisville, Ky.

Fig. 9 is the estimated power curve of this engine. This is an approximation only, based on a bore of 3⅜ in., a stroke of 5 in. and a crankshaft speed of 2600 r.p.m. The official power curve is not available.

FIRING ORDER OF TWOMBLEY ENGINE

Q—Publish the firing order of the Twombley model A engine, car No. 1293, made by the Driggs-Seabury Co., Sharon, Pa.—J. H. Martin, Knoxville, Pa.

The firing order of this engine is 1-3-4-2.

SPEEDS OF DODGE ENGINES AND CARS

Q—What is the greatest possible number of increases of revolutions that a Dodge engine can be made to turn over?

2—What is the speed that it would make with a ratio of 4 to 1 and 32 by 4 tires at 2000 r.p.m., 200 r.p.m., 2500 r.p.m. and 3000 r.p.m.—if it will turn over that fast?—Charles L. Hesh, McComb Fire Department, McComb, Ill.

1—Referring to the test card shown in Fig. 8, it will be seen that the standard Dodge engine delivers its greatest power at 2200 r.p.m., while with a popular make of 16 valve head it delivers 60 hp. at 2400 r.p.m. The last is the maximum speed possible. Approximate speeds at the revolutions given: 45 m.p.h., 50 m.p.h., 57 m.p.h. As is plain to be seen from the power curve, the engine cannot be made to turn 3000 r.p.m.; however, if

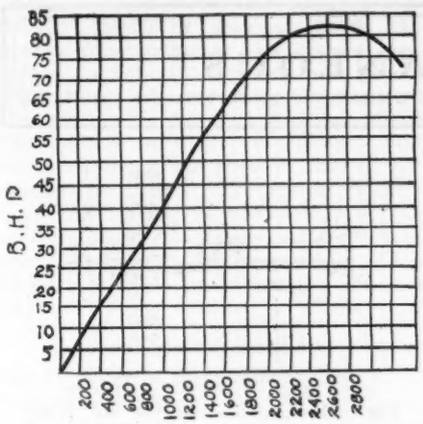


Fig. 9—Calculated power curve of Lincoln 8 cyl. engine, 3⅜x5

this were possible, it would develop a speed of approximately 75 m.p.h.

WANTS TO CONVERT STOCK 490 CHEVROLET INTO RACING ENGINE

Q—We have a new Chevrolet 490 engine that we intend to remodel for racing. How many revolutions per minute will this stock engine make?

2—What horsepower will it develop?

3—If we add counterbalances to the crankshaft will it be necessary to reduce the weight of the flywheel?

4—To have a successful cooling system should we install a water pump?

5—What manufacturer makes 16 valve heads for Chevrolet 490?—Carroll Smith, Box 237, Hobart, Okla.

1—Referring to the power curve shown in Fig. 11, it will be seen that the stock Chevrolet engine develops 25 hp. at between 1800 and 2000 r.p.m. To rebuild the engine into a successful racing power plant it will be necessary to increase the r.p.m. by lightening such parts as the pistons and connecting rods. An r.p.m. of 2500 to 2600 should be aimed at.

2—See above.

3—Yes, it will probably be necessary to take considerable metal off the flywheel. Incidentally, this should be done whether the counterbalances are installed or not. Several MOTOR AGE readers can supply definite information as to the use of counterbalances.

4—We would recommend that the stock pump be given a fair trial before it is replaced with another.

5—We know of no manufacturers making 16 valve heads for this engine.

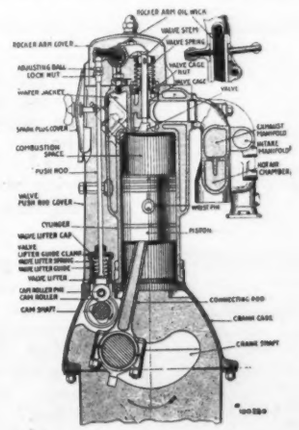


Fig. 10—Sectional view of Buick engine, showing a connecting rod

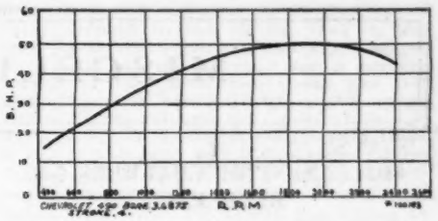


Fig. 11—Record of dynamometer test showing power curve of the Chevrolet 490 engine

ATTENTIVE READER MAKES A CORRECTION

Q—Publish the firing order of the Twombley Model A car No. 1293 made by Driggs Seabury Co., Sharon, Pa.

2—Also what four-cylinder engine fires 1, 2, 3, 4 order, as I see in August 11 issue of MOTOR AGE. I have never seen the engine as yet. Publish cut in an early issue.

This information is not available. We have taken the matter up with the manufacturer and will advise you as soon as possible. The error mentioned was entirely typographical. The second paragraph should have read "as the firing orders on all four-cylinder engines are either 1, 2, 4, 3 or 1, 3, 4, 2," etc. We thank you for your attention and calling the error to our notice.

LIGHTENING CONNECTING RODS A RISKY PROCEDURE

Q—How much can Buick connecting rods be lightened? How much can be taken off a Buick connecting rod with safety? We wish to lighten them as much as possible.—Eldridge Buick Sales Co., Seattle, Wash.

2—Where can I buy connecting rods? Are they practicable? Will they not bend at high speeds or at low speeds under a heavy pull?—E. O'Donnell, Seattle, Wis.

We have no definite figures on this subject. However, we would advise you to proceed with great caution. Fig. 10 illustrates the connecting rod and piston. The former may be lightened by drilling the web with holes, beginning not closer than two inches above the center line of the bearing. The bottom hole can be large and the remainder of them progressively smaller.

The rest of your inquiry is being replied to by mail direct.

2—This is being answered by personal letter.

If they are made of the proper alloy and in the proper form they should be entirely practicable and should not spring at high speed or under heavy load.

REBORING MAXWELL CYLINDERS

Q—Will any model Maxwell engine stand reboring to Ford size?—Harry Leckion, Abilene, Kan.

As the Standard Maxwell bore is 3⅝ in. and the Ford bore 3¾ in., it would be necessary to remove ⅛ in. from the cylinder, or 1/16 in. on each side. We are of the opinion that this is altogether too deep a cut and that it would weaken the cylinders too much. The standard practice when reboring Maxwell cylinders is to remove not more than .025 in., which is only .0125 in. on each side. On the whole, we believe it will be better to procure a whole new block and pistons rather than undertake the expensive and risky reboring job.

MISCELLANEOUS

ADJUSTMENT OF CHALMERS 6-30 REAR AXLE

Q—Publish an internal view of the Timken axle used on the Chalmers 6-30 1916 model.

2—Instruct us how to adjust the pinions for wear. The propeller shaft on this car has a backlash of over a half a revolution when grasped by hand. Can this account for the jerky action of the car at low speeds in high gear? Is it possible to move the ring gear endwise in relation to the shafts? If so, how can this be done if the pinion adjustment fails to compensate for the backlash?—Carl A. Roden, Scranton, Pa.

1—See Fig. 12.

2—We think it likely that the great amount of backlash is caused by wear throughout the drive system, principally in the bearings of the small differential pinions inside the differential case. The instructions for adjusting the gears are as follows: the pinion gear is to be adjusted to the ring gear so that the backs of the gear teeth are as even as possible. This can be inspected by removing the pipe plug in the top of the differential case.

The proper clearance between the teeth varies from .004 to .008 in. Do not try to adjust the pinion by moving the large castle nut just in front of the universal joint, as this nut only adjusts the Timken bearings on the pinion shaft. The pinion gear is adjusted forward and back by means of the two set screws, one on each side of the pinion bearings. In the illustration, the screw to the left is marked "Pinion Gear Adjusting Screw." This one serves to set the whole bearing and gear inward toward the ring gear, while the screw to the right is used to move it outward.

The ring gear is moved to the right or left by turning the notched adjusting nuts on each side. It is, of course, first necessary to remove the small locking keys which will be found in the bearing caps. Driving the righthand bearing adjusting nut to the right and the lefthand nut to the left has the effect of moving the ring gear to the left. To move it to the right, into deeper mesh with the pinion, move the adjusting nuts in the opposite direction. Timken bearings are not to be set up tight. A little play must be allowed.

Although the amount of backlash described is unusual and should be remedied, it does not necessarily account for the jerky action of the car. If the engine is pulling smoothly, the lash should be taken up, except at such times as when the throttle is closed and then opened again, as at crossings, or when slowing down for any reason. Of course, in this event the car has a tendency to run ahead of the engine and cause the lash to occur in the opposite direction. If the throttle is continually opened and closed in a jerky manner, as in going over a rough road, the lash is, of course, very noticeable and destructive. Unless it is remedied, a serious breakage is inevitable.

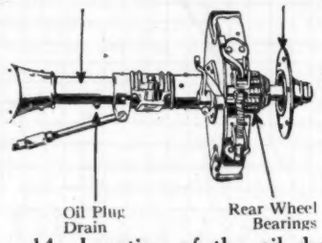


Fig. 14—Location of the oil drain plug in the axle of the 1916 Mitchell car

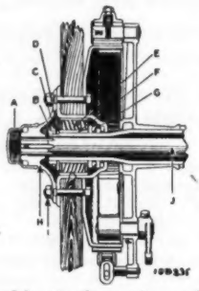


Fig. 15—Vertical section of a 1916 Mitchell rear wheel

REAR AXLE LEAKS GREASE

Q—Advise us how to stop grease leakage from the rear axle of a Mitchell, model 1916.—Service Garage, Mineral, Ill.

We think it quite likely that you are maintaining the lubrication level too high in this axle. If this is the case it will be very difficult to stop the annoying leakage by any means. Figs. 14 and 15 show the provision of the manufacturer to avoid the trouble. In Fig. 14, showing one-half of the rear axle, it will be seen that oil draining plugs are provided in the bottoms of the axle housing. These should be removed periodically and the excess lubricant allowed to drain out. Fig. 15 shows a section of one of the rear wheels. It may help matters to install a thick felt washer immediately behind the ball thrust bearing marked "G." As a rule, rear axles are over-lubricated and while this is permissible in the winter time it proves very annoying during the hot months, for the reason that the lubricant is almost certain to soften and run.

DODGE STEERING GEAR ADJUSTED TOO TIGHT

Q—Can a Silver Town cord tire be repaired when the wire bead breaks? How?

2—What is the cause of and remedy for binding and groaning of a Dodge steering gear when it is turned? New bushings and gears have been installed, and it seems to turn easily and noiselessly when disconnected. There is plenty of grease in it.

3—Is it best to straighten a front axle cold or hot? Why?—Geo. M. Ferre, Salt Lake City, Utah.

1—We would not advise attempting to repair the wire bead of any tire.

2—Refer to Fig. 13 and to the instructions on adjusting the Dodge steering gear, which appeared on page 40 of the Readers' Clearing House Department in the July 14 issue. We believe it quite possible that you have screwed the worm adjusting nut down too tightly. This would cause the gear to bind, whether the sound complained of was emitted or not.

3—Hot. It is much easier to work and is less liable to set up internal strains than if the attempt were made to straighten it cold.

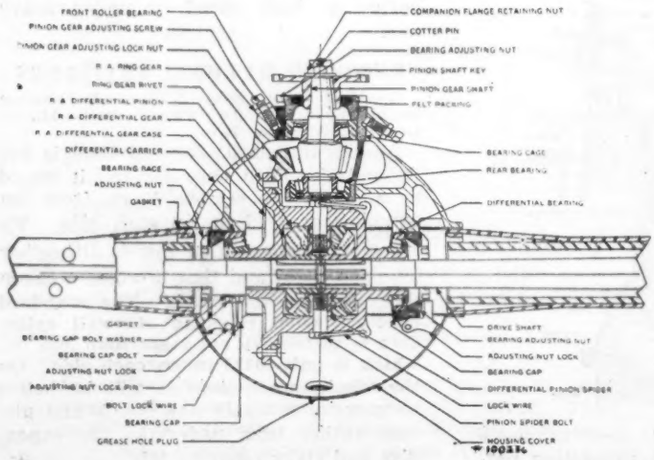


Fig. 12, Left—Sectional view of axle used on Chalmers 1916, model 6-30, showing points of adjustment

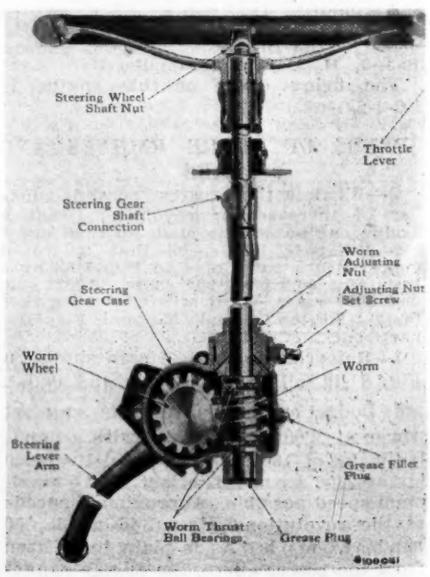


Fig. 13, Right—Internal view of the Dodge Brothers steering gear. Drawing down too tightly on the "Worm Adjusting Nut" causes building

MYSTERY TALE

The Strange Behavior of the Lights on a Dodge Car

Q—After the overhauling and replacing of the starter generator on a 1916 Dodge, the lamps burn very dim while the engine is running, but with the engine at rest, they are perfectly normal. After checking the wiring, everything was found to be all right, according to the instruction book, except the ground wire leading from the negative terminal of the battery to the frame. Upon replacing this, the lamps were normal with the engine running, but the wire became heated, as if short-circuited. The starter cranks the engine at all times and the generator also is keeping the battery charged.—Battery Dept., Hawkeye Vulcanizing Co., Charles City, Ia.

Refer to Figs. 16 and 17. Fig. 16 shows the external circuits of this system, while Fig. 17 shows the internal circuits of the starter generator and the master relay. We think it evident that there is an abnormal ground of some magnitude in this system. There may be even two grounds, which would account for the fact that the light burns with the grounding wire removed from the negative terminal of the battery as this should not be. Beside this, we believe that a ground will be found in the positive side of the battery. By this we do not mean that the battery itself is grounded, but that the positive cable is grounded somewhere between the battery and the starter generator, or possibly inside of the latter unit.

The fact that the lights burn dim with the engine running leads us to believe that the abnormal ground will be found in the positive brush holder (that connecting with terminal No. 3 of the starter generator) or in the master relay. The ground on the negative side of the battery we believe will be found in the cable leading from the battery to the starter generator No. 1, cable terminal, or in the starter generator series field winding. These grounds are many times found at the point where the large loom which incloses the starter generator cables, comes in contact with the engine splash apron.

Although not a common occurrence the sharp edge of the splash apron sometimes wears through the loom and the cables and causes either a high resistance ground or a complete short circuit.

A partially grounded armature will also cause the same effect, but this fault usually interferes seriously with the proper functioning of the starter generator on both the starting and generating sides. At any rate, the negative grounding wire must be replaced if the lights are to burn to full brilliancy, and any grounds in the positive side of the system, be they in the cables leading from the battery to the starter generator or in the latter apparatus itself, must be cleared. (Other solutions of the mystery will be given careful analysis and publication.—Ed.)

MYSTERY TALES

Valves Seem to Have Odd Compound Action

Q—We have been working on Cole cars series 870 and all the owners complain of the small amount of power their cars develop. In checking over the engine we find the camshaft gives what we call a false opening to the valves; that is, the cam opens the valve and the valve stays, or dwells at the opening for a certain length of time and then opens the full distance. The result is the valve opens before it should and consequently is too early in closing. Instead of closing fully it closes part way and then dwells at the false closing and after a further camshaft travel closes entirely. We obtain this result when we adjust the valves at .004 clearance, as recommended by the factory. By adjusting the tappets to .020 we do away with the false opening. Is the camshaft right or not? Have you ever heard of such a case before?—A. Jullien, Calgary, Alberta, Canada.

We must admit that this is a new one to us. Is it not possible that you have erred in your observation? We can hardly credit that the error is on the part of the engine builder. The distance to which you are setting the tappets—.020—is altogether too great. A better setting has been found to be .006 for the intake and .007 for the exhaust valves.

(If others of our readers have noticed the peculiar condition mentioned we should be pleased to hear from them. —Ed.)

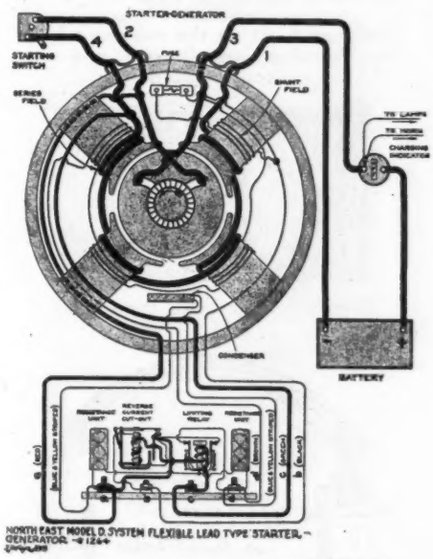


Fig. 17—Winding and internal circuits of Northeast Model D motor generator and master relay used on 1916 Dodge Brothers cars.

MYSTERY TALES

YOUR mystery may be an open book to some other reader and, on the other hand, his problem may be an old story to you. So send in your mystery tales and give everybody a chance to exchange experiences. This practice will do us all good.

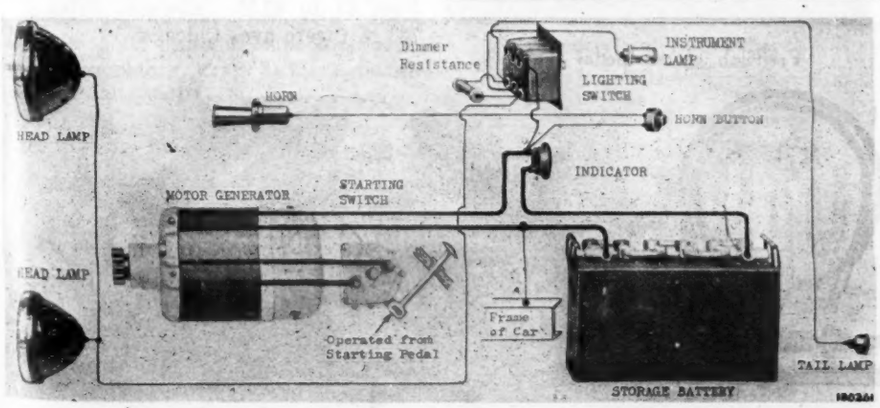


Fig. 16—Exterior wiring of Dodge Brothers cars using Northeast Model D motor generators.

TWO MYSTERY TALES

Oil Evaporates Into Thin Air

Speaking of mysteries, we have two on a 1920 Oldsmobile sedan: first, the rear axle consumes two quarts of 600 W oil every thousand miles and does not leak a drop. This seems too high to us, as other cars usually run from 3,000 to 4,000 miles on that much oil. Should we put in a heavier lubricant?

Second, in the right front wheel there is a click only noticeable when slowing down to a stop or almost stopped. It sounds very much like a rim click but we have changed rims, tightened lugs, changed the position of the lugs, tightened the hub flanges, etc. The spokes look tight, as the joints are alright and there are no indications of cracks, as there would be if the spokes were loose. This click occurs when the split of the rim is down. What explanation can you offer?—Neil C. Ensworth, Warren, Pa.

(These two mysteries should keep the Mystery Tales fans interested for some time. Exercise your wits. It will do yourselves and everybody else good.—Ed.)

TIGHT CLIPS PREVENT SPRING BREAKAGE

It is good practice to suggest to the owner that he have the spring clips of his car tightened up. It is surprising the extent to which these members loosen in a comparatively short time. One of the large manufacturers is authority for the statement that loose clips are responsible for the major percentage of spring breakage, as they allow the springs to flex at the bolt hole.

REMODELING OBSOLETE SIZE WHEEL

Q—What would be the approximate cost of cutting down 34 by 3½ and 35 by 4 wheels to 32 by 4, and who does this work?—Earl Cooper, Denver, Colo.

The approximate cost is $50. For this price the concern cuts the wheels down to the proper size, furnishes five rims and applies four of them.

Your query is being replied to more fully by letter.

The Accessory Show Case

New Fitments for the Car

AUTOLOG FOR RECORDING FUEL AND OIL CONSUMPTION

The Autolog is a disk instrument 2½ in. in diameter, designed to fit on the steering wheel of any car. Every time oil or gasoline is bought the driver marks down the quantity through the pencil opening under the current date. On the back of the record card there are spaces to insert the speedometer mileage on the first and last day of each month and the total gas and oil consumed for the month. This gives the car owner a month-to-month record of what his car is doing. Price, complete with twelve monthly record cards, $2. Autolog Co., 1032 S. Grand ave., Los Angeles, Calif.

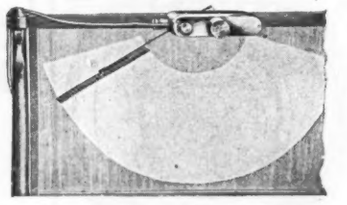
Designed to fit on the steering whel, the Autolog records fuel and oil consumption

MANDT STEEL DUMP BODY

This steel dump body is made for attachment to the Ford one-ton truck, without drilling holes. The body is so balanced that only one foot of load is lifted by the hoist. The body is made of one piece steel plate, heavily riveted and reinforced. The end gate is double acting, operating from the side or from the seat. Lifting two pins converts it into an express body. Mandt Co., Keokuk, Ia.

EVEREADY AUTOMATIC WINDSHIELD CLEANER

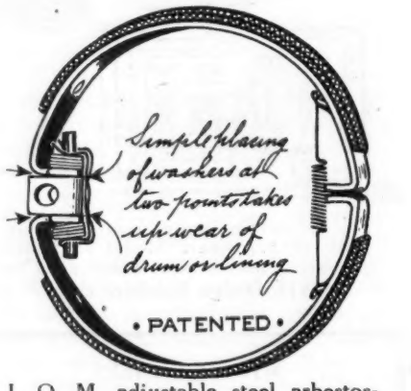
Connected to the manifold or the vacuum system, the Eveready windshield cleaner works back and forth automatically when the button controlling it is pushed. Shipped complete with full instructions for installation. Price $10. Apex Electric Mfg. Co., 1410 West 59 st., Chicago.



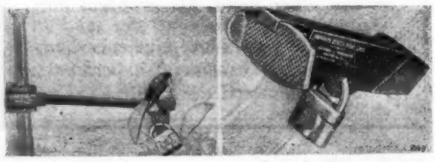
Eveready automatic windshield cleaner

FREDRICH CLUTCH PEDAL LOCK

The Ford model locks the foot pedal in a neutral position with the brake set. The model for other cars locks the clutch and prevents putting the transmission into gear. It is made of sheet steel; any round shank padlock may be used. Price, Ford lock, $2.75; other cars, $1.75. Edward J. Fredrich, 3405 Fifth ave., Minneapolis.



J. O. M. adjustable steel asbestos-lined brake shoe for Fords



Fredrich clutch pedal lock

EMERGENCY BRAKE SHOES FOR FORD CARS

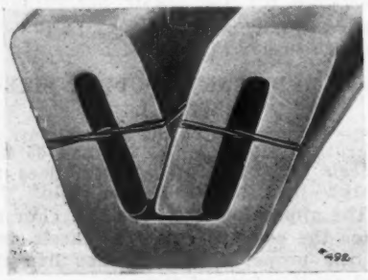
Lined with a combination asbestos fabric and brass mesh lining, the J. O. M. adjustable steel asbestos-lined brake shoes for Ford cars are designed to take the place of the cast iron shoes furnished as stock equipment. Being of heavy gage sheet steel, they are practically unbreakable and the asbestos lining presents a sure-gripping, long-wearing surface. When wear has progressed to the point that the shoes no longer are effective, their usefulness can be restored by applying washers between the ends of their rear halves and the regular brake supporting bracket. Distributed by The James Bailey Co., Portland, Me.

NEW PERKINS-CAMPBELL FAN BELT HAS DIFFERENT CONSTRUCTION

As illustrated on this page, the leather of the Perkins-Campbell fan belt is pulled over and pressed into a V shaped unit, forming an opening or crease on the upper surface. This crease permits the belt to expand as it passes over the pulley, centrifugal action pressing the entire traction surface of the V-shaped section outward against the pulley walls. These belts are made for all cars using V type belts. The Perkins-Campbell Co., 622 Broadway, Cincinnati.

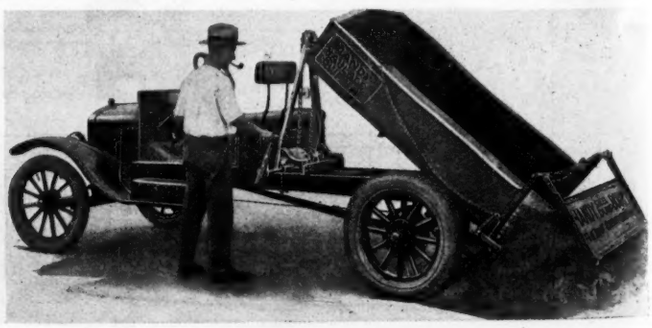
EDWARDS TOW LINE AND CABLE TIRE LOCKS

The Edwards tow line is of copper-clad cable, leather-covered and has a resistance spring to take up the shock, when starting. The steel chain attachments have hooks at each end and can be coiled and placed under the seat. The weight is 13½ lb., length, 13½ ft., price, $7.50. The tire lock chains are leather covered cables with links. Prices range from $1 to $2.50. Edwards Sales Co., 723 N. Cicero ave., Chicago.



Perkins-Campbell fan belt

Edwards tow line and tire locks



Mandt steel dump body for attachment to Ford truck

Service Equipment
Time Savers for the Shop

YORK CYLINDER REBORING MACHINE

The York cylinder reboring machine has two feeds—fast and slow. The fast feed advances the boring bar .072 in. per revolution. The slow feed advances the boring bar .030 in. per revolution. A continuous feed of the boring bar is provided because its turning and the driving of the feed mechanism is simultaneous. This feed mechanism consists of a set of quick change transmission gears mounted on a gear driveshaft which has a sliding key. These gears are driven by the same double bevel driving pinion which turns the boring bar, and mesh with a pair of gears keyed on the lead or feed shaft which has a worm mounted on its upper end operating through a large worm and spur gear driving the rack. Thus the boring bar is advanced in keeping with the change gears which are in action. Flinchbaugh Machine Co., York, Pa.

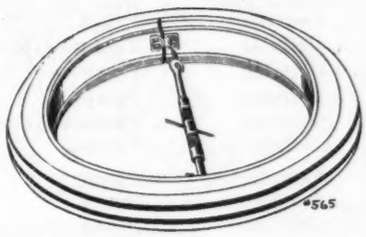
U. S. TIRE TOOL FOR REMOVING AND REPLACING RIMS

When turned, the knurled handle of this rim tool expands or contracts the rim. It has a rod with a solid hook on the extreme end engaging the center handle and a similar rod with a swivel hook screwing into the handle at the other end. The tool folds to 12¾ in. long and weighs less than 3 lbs. Price, $6 and $7.50. W. B. Haines, Sunbury, Pa.

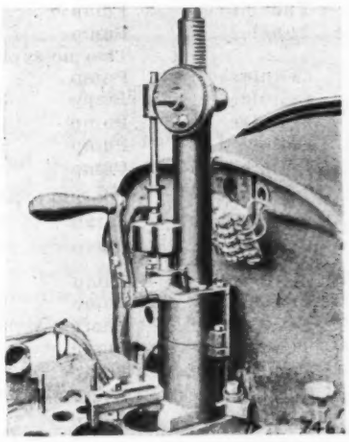
LOUDON COTTERPIN PULLER

The tool consists of a short steel point with a hook on the end to go into the head of the cotterpin or roller bearing. This point is threaded on to a rod by a short sleeve. On the rod is a sliding hammer. This sliding hammer comes against the stop at the end, exerting a sharp straight pull. It only requires three or four taps of the hammer to pull the largest cotterpin. It can be used for getting out rear axle roller bearings and straightening fins and tubes in radiators. Price $1.75. Loudon, Inc., of Minneapolis.

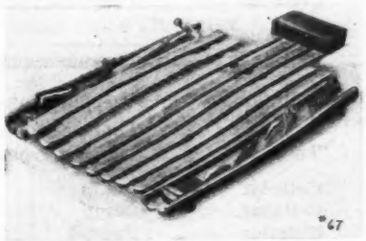
Rhodes oil service cans for dispensing oil facilely



U. S. tire tool for use in removing and replacing rims

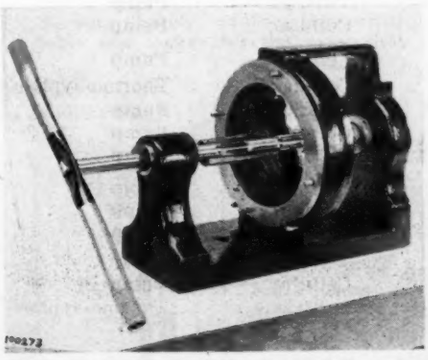


York cylinder reboring machine, which has a fast and a slow fuel feed



Tray on roller bearing castors for use in work under cars

Loudon cotterpin puller



Transmission bushing reamer for Ford cars

PETERS UNIVERSAL BEARING REAMER

The Peters universal bearing reamer is adjustable to all types of engines. It is equipped with a universal jig for boring all connecting rod bearings to size and alignment. The micrometer adjustment on the boring bar sets the cutter to the exact size of the boring desired. The connecting rod jig is located at the extreme end of the boring bar. This machine can be operated in all standard types of four, six, eight and twelve-cylinder engines. Price, $250. Peters Incorporated, Widener Bldg., Philadelphia.

FORD TRANSMISSION BUSHING REAMER

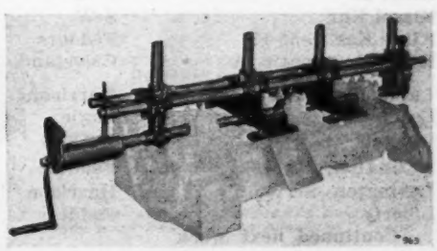
A new article of service equipment is a Ford transmission bushing reamer which grips the drums tightly and holds them in rigid alignment with the cutting tool, so that the bushing is reamed true with the center. Another fitting permits the true reaming of the triple gear bushing, while a third part of the device faces over length bushings to the right dimension. Manufactured by the Keystone Reamer & Tool Co., and marketed through the Western Sales Division, 180 N. Market St., Chicago.

RHODES OIL SERVICE CANS

These oil containers offer a handy way of dispensing oil in the garage or service station. A carrier holds eight of these cans with a total capacity of two gallons. The can may be filled through the metal spout. The patented vent allows the oil to flow out in a continuous stream. The Cable Sales Co., 315 E. Main street, Kalamazoo, Mich.

TRAY FOR WORKING UNDER CARS

This dolley is 37 in. long, 22 in. wide and 3 in. from the floor on four roller bearing malleable iron casters. It has an upholstered head-rest and a rack on the sides for tools. Natural wood finish. Lewis-Geer Mfg. Co., Ypsilanti, Mich.



Peters universal bearing reamer, adjustable to all types of engines

Radiators on 1921 Passenger Cars

Motor Age Maintenance Data Sheet No. 169

One of a series of weekly pages of information valuable to service men and dealers—save this page

Car and Model	Radiator Make	Radiator Type	Water Circ. System
Ace, G	Kuenz	Cellular	Pump
Allen, 43	Mayo & McCord	Cellular	Thermo-syphon
American, C	Livingston	Cellular	Pump
Anderson, 40	Fedders	Cellular	Pump
Apperson, 8-21	Own	Tubular	Thermo-syphon
Auburn, 6-39	Jamestown	Cellular	Pump
Beggs, 20T	Can	Cellular	Pump
Bour-Davis, 21-5	Eureka	Tubular	Pump
Brewster, GL	E & M	Cellular	Pump
Briscoe, 4-34	Sparton	Cellular	Thermo-syphon
Buick	Own	Cellular	Pump
Cadillac, 59	Own	Tubular	Pump
Case, V	Own	Tubular	Pump
Champion Special	Optional	.....	Thermo-syphon
Chandler	Harrison	Cellular	Pump
Cleveland, 40	Harrison	Cellular	Pump
Climber, S Six	S-W	Cellular	Pump
Cole 870	McCord	Cellular	Pump
Columbia Six	Harrison	Cellular	Pump
Commonwealth, 44	B & W	Cellular	Thermo-syphon
Crawford, 21-6-40	Bush	Tubular	Pump
Cunningham, V-4	Fedders	Cellular	Pump
Daniels, D-19	G & O	Cellular	Pump
Davis, 51	M-R & Mayo	Cellular	Pump
Dixie Flyer, H.S.70	Candler	Cellular	Thermo-syphon
Dodge Brothers	McCord	Tubular	Pump
Dorris, 6-80	Fedders	Cellular	Pump
Dort, 17-A	Fedders	Cellular	Thermo-syphon
Dupont, A	McCord	Cellular	Pump
Elcar, 7-R	Jamestown	Cellular	Pump
Elgin Six, K	Standard	Cellular	Thermo-syphon
Essex, A	Harrison	Cellular	Thermo-syphon
Franklin, 9-B	Air Cooled	.....	.....
Friend Four	Candler	Cellular	Thermo-syphon
Gardner, G	Fedders	Cellular	Thermo-syphon
Globe Four, B-10	U. S. C.	.....	Thermo-syphon
Grant Six, HX	Long	Tubular	Thermo-syphon
H.C.S. 3	Fedders	Cellular	Pump
Halladay, 21	Kuenz	Cellular	Pump
Hanson Six, 60	Long	Tubular	Pump
Harroun, AA-2	Own	Cellular	Thermo-syphon
Hatfield, A-42	Jamestown	Cellular	Thermo-syphon
Haynes, 47	Fedders	Cellular	Pump
Holmes, 4	Air Cooled	.....	.....
Hudson Super Six	Harrison	Cellular	Pump
Hudson, O	Harrison	Cellular	Pump
Hupmobile, R	McCord	Cellular	Thermo-syphon
Jackson, 6-38	Long	Tubular	Pump
Jordan, M	Sparton	Cellular	Pump
Kenworthy, 8-90	Mayo	Cellular	Pump
King, H	M-R	Cellular	Thermo-syphon
Kissel Kar	S-W	Cellular	Pump
Kline Kar, 6-55-K	Fedders	Cellular	Pump
Kurtz Automatic, A	Cleveland	.....	Pump
LaFayette, 134	Harrison	Cellular	Pump
Leach	Eagle	Tubular	Pump
Lincoln	McCord	Tubular	Pump
Lexington, Series S	Fedders	.....	Pump
Lexington, Series T	Harrison	Cellular	Pump
Liberty	Fedders	.....	Thermo-syphon

Continued next week

ABBREVIATIONS: Can, National Can Co.; E & M, English & Merrick; S-W, Sparks-Withington; S & J, Shotwell & Johnson; M-R, Marlin-Rockwell; U. S. C., U. S. Cartridge.

SOCIETY OF AUTOMOTIVE ENGINEERS WORKING ON WATER-PIPE FITTINGS STANDARDS

THE present S. A. E. Standard for Radiators specifies inlet and outlet flanges identical in dimensions to the S. A. E. standard two-bolt carbureter flanges. It also specifies that the fittings themselves shall be cast separate from the radiator tanks, as when radiators are shipped with the fittings cast on there is danger of their breaking off during transportation. In addition, automobile and truck manufacturers can purchase them to better advantage than the radiator manufacturers because they are purchasing a larger number of castings.

As it seems desirable to have a standard for these fittings, so that they can be sold as standard parts, a tentative specification for water-pipe fittings has been laid out, using the dimensions specified by the S. A. E. radiator division for the pad dimensions and the dimensions for the length of fittings and the outside diameters specified in the present S. A. E. standard for rubber hose clamps and fittings. Blueprints of this tentative proposal have been mailed recently to radiator manufacturers and used, for their criticism.

AUTOMOBILE BUMPER MOUNTING

The passenger-car manufacturers have been circularized by the S. A. E., requesting their opinions as to whether or not the standardization of a plain bolted-on bumper connection would, if adopted by the society, be generally adopted in future passenger-car practice.

The replies to this general letter indicate that twenty-one out of twenty-four companies, or 90 per cent, believe *that such standardization is highly advisable and would be adopted in practice.*

It is expected that the standards committee subdivision on automobile bumper mountings will be able to submit a preliminary recommendation at the meeting of the parts and fittings division.

CORRECTION

We wish to correct an error which was made on page 45 of the July 14th issue of MOTOR AGE. In the Maintenance Date Sheet Number 158, the type of fan belt used by Chevrolet 490 read as "flat" when it should have been "vee."

Automotive Repair Shop
Practical Maintenance Hints

Combination Table and Locker for Repairshop

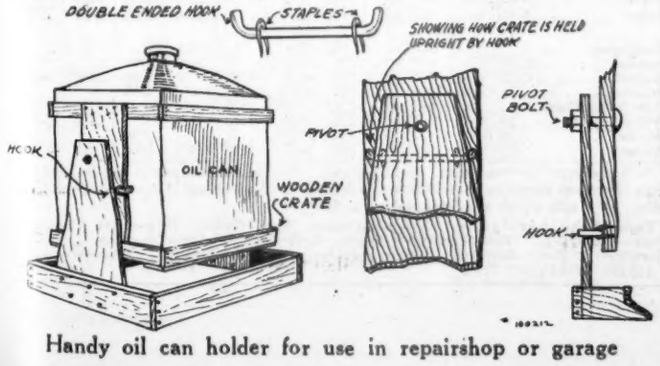
For use in the repairshop or garage a fixture, shown in the illustration, serves the combined purposes of a shelf, table and locker or compartment for storing parts. As a bench, this fixture is adaptable to the purposes of the foreman or head mechanic, and is very compact. The table is not substantial enough for heavy purposes, yet will serve for light work on electrical equipment, carbureters, gaskets, etc., or on charts or drawings. As shown in the drawing, the usual shelf board is fitted with a hinged door, having two folding legs on the under side. At each side of the shelf two vertical boards serve to support the shelf and close in the compartment underneath. The table or door is secured by means of a lock either at the floor or at the side. Extra shelves are added, as desired, between the uprights at the sides of the top shelf.

Oil Can Holder for Garage or Shop Use

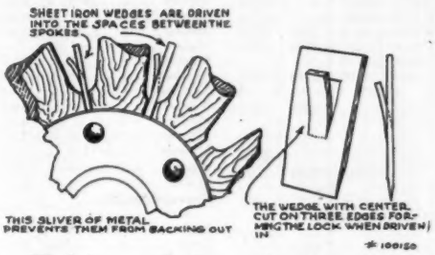
Five gallon or larger cans of lubricating oil are difficult to handle, that is, to tip for the purpose of emptying out a part of their contents. To make it easy to pour and avoid the waste occasioned by overflowing of the oil when the can is not held rigidly, a convenient fixture made from several pieces of plank is shown in the accompanying drawing.

The crate is made to the outside size of the can, and the pivot is placed about half way to the top of the crate. A double-ended hook is stapled to the side of the crate, and adjusted so that it may be turned into position, engaging one support and holding the can in an elevated position until it is desired to tip it for pouring. This holder is set on one edge of the work bench, preferably the end, where it is most convenient.

With the aid of this simple fixture it is easy to measure out quarts, pints or even fill oil cans without waste, as the heavy can is always under perfect control. A similar apparatus will be found of great assistance in the battery shop for mounting acid carboys.



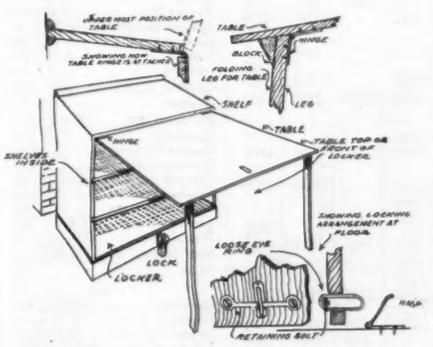
Handy oil can holder for use in repairshop or garage


SHEET IRON WEDGES ARE DRIVEN INTO THE SPACES BETWEEN THE SPOKES
THIS SLIVER OF METAL PREVENTS THEM FROM BACKING OUT
THE WEDGE WITH CENTER CUT ON THREE EDGES FORMING THE LOCK WHEN DRIVEN IN

Wedging wheel spokes prevent creaking

Cooperation

COOPERATION is the keynote of the automotive industry this year and will become more important as time goes on. Motor Age is pleased to extend an invitation to its readers, wherever they may be, to contribute short articles and sketches on easy or improved ways of doing hard things, which they may have worked out and thus lend their aid in HELPING THE OTHER FELLOW. Correspondence among contributors is also strongly urged. Let's get together and make this a happy family with one end in view, that of hearty, unselfish COOPERATION.



A very handy combination shelf, table and locker for the repairshop

Protective Measure Prevents Drill Breakage

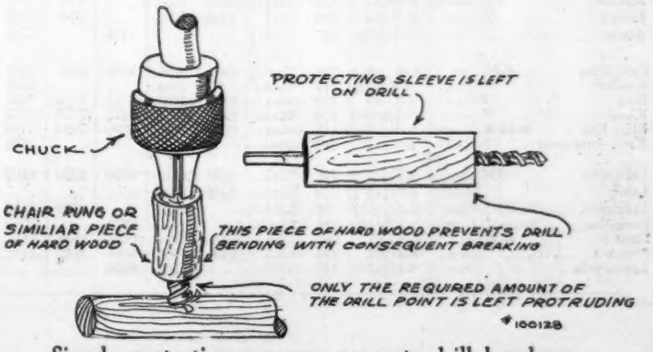
Small drills are broken off long before they are worn out in service, and apart from their cost it is sometimes difficult to replace the various sizes without sending out of town for them. To avoid premature breaking of drills, use a piece of hardwood over the flutes with only the required amount of the point protruding. This piece of wood once placed on the drill can be left there after the drill is removed from the brace or chuck and is at hand each time the drill is used. This protector is made from a hard chair rung or similar piece. Aside from the loss of breaking the drill the point often sticks in the hard steel and its removal is difficult. With the sleeve on the point, the bending of the drill with the resultant breakage is avoided.

Wedging Wheel Spokes to Prevent Creaking

Automobile wheels loosen at the junction of the spokes and hub after a period of use or after a car is driven on a flat tire or on the bare rim. While the hub plate bolts can be tightened to prevent side movement of the spokes the play between them is enough to cause an annoying creaking. To overcome this, a wedge of sheet iron or galvanized iron can be driven between the spokes to take up the lost motion. The wedge is made as shown in the illustration. The sliver of the metal acts as a key to prevent them coming out after being driven in. Where many spokes are loose, one of these wedges is placed between each, otherwise a wedge at every other spoke will suffice.

An Excellent Spark Plug Cleaner

Steel wool is the best thing to use in cleaning carbon from spark plug porcelains. It cuts away the discoloration very rapidly, but does not scratch the highly-glazed surface of the porcelain as sandpaper or emery cloth do.—Geo. W. Brickner, Peoria, Ill.


PROTECTING SLEEVE IS LEFT ON DRILL
CHUCK
CHAIR RUNG OR SIMILIAR PIECE OF HARD WOOD
THIS PIECE OF HARD WOOD PREVENTS DRILL BENDING WITH CONSEQUENT BREAKING
ONLY THE REQUIRED AMOUNT OF THE DRILL POINT IS LEFT PROTRUDING

Simple protective measure prevents drill breakage

Specifications of Current Passenger Car Models

NAME AND MODEL	Engine Make	Cylinders, Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan
Ace.....G	Guy..	6-3½x5	123	32x4	$2975	$2975	....	$3680	$3680
Ace.....H	H-S...	6-3⅝x5	123	32x4	2975	2975	....	3680	3680
Ace.....L	H-S...	4-3¼x5	116	32x4	2260	2260	....	....	....
Allen.....Series 43	Own..	4-3½x5	110	32x4	1195	1195	....	....	1845
Ambassador.....R	Cont..	6-3⅜x5¼	136	33x5	....	†4500	$4500	....	6500
American.....C	H-S...	6-3¼x5	127	32x4	2195	2195	†2350	....	3150
Anderson.....Series 40	Cont..	6-3¼x4½	120	32x4	2195	1795	1845	2795	2795
Apperson.....8-21-S	Own..	8-3½x5	130	34x4½	....	3000	3250	4500	4500
Apperson...Anniversary	Own..	8-3½x5	130	34x4½	....	3500	3750	....	....
Auburn.....6-51	Cont..	6-3¼x4½	121	32x4	1671	1695	1760	2475	2495
Beggs.....20T	Cont..	6-3¼x4½	120	33x4	1775	1775	....	2675	2775
Bell.....4-32	H-S...	4-3½x5	114	31x4	....	1495	....	....	....
Bell.....6-50	H-S...	6-3¼x5	124	32x4	....	1695	....	....	....
Biddle.....B1	Budа..	4-3¼x5½	121	32x4	3475	3475	....	....	3975
Birch Super-Four	H-S...	4-3½x5	117	33x4	1195	1195	†1245	2295	1795
Birch Light Four	Lelt..	4-3½x4½	108	30x3½	1045	1045	....	....	....
Birch Light Six	H-S...	6-3¼x5	117	33x4	1395	1395	†1445	....	1995
Bour-Davis.....21S	Cont..	6-3½x5¼	126	33x4½	†2385	†2385	2385	....	....
Brewster.....91	Own..	4-4 x5½	125	32x4½	†7000	7000	....	....	10500
Briscoe.....4-34	Own..	4-3⅜x5	109	31x4	1085	1085	....	1685	1685
Buick..1922-31-35-35-37	Own..	4-3⅜x4¾	109	31x4	935	975	....	1475	1650
Buick.....1922-44-5-6-7	Own..	6-3⅜x4½	118	33x4§	1495	1525	....	2135	2435
Buick.....1922-48-9-50	Own..	6-3⅜x4½	124	34x4½	....	....	1735	2325	2635
Bush.....E.C.4	Lyc...	4-3½x5	116	33x4	....	1195	....	....	....
Bush.....E.C.6	Rut...	6-3½x5	116	33x4	....	1345	....	1750	1850
Cadillac.....61	Own..	8-3 1/16x5½	132	33x5	3790	3790	3940	4340	4950
Case.....V	Cont..	6-3½x5¼	126	34x4½	....	†2250	2250	2900	3285
Chalmers.....6-30	Own..	6-3¼x4½	117	32x4	1495	1545	....	2295	2445
Chalmers.....6-30	Own..	6-3¼x4½	122	33x4½	....	....	1795	....	....
Champion.....Tourist	Lyc...	4-3½x5	113	32x3½	....	1095	....	....	....
Champion.....Special	H-S...	4-3½x5	118	32x4	†1395	1395	....	....	....
Chandler.....Six	Own..	6-3½x5	123	33x4	1785	†1785	1785	2785	2885
Chevrolet.....490	Own..	4-3 1/16x4	102	30x3½	525	525	....	875	875
Chevrolet.....FB	Own..	4-3 1/16x5¼	110	32x4	975	975	....	1575	1575
Cleveland.....40	Own..	6-3 x4½	112	32x4	1295	1495	....	2195	2295
Climber Four	H-S...	4-3½x5	115	33x4	1450	1385	....	....	....
Climber Six.....S	H-S...	6-3¼x5	125½	32x4½	2250	2250	....	....	....
Cole.....870	Nort..	8-3½x4½	127	33x5	2550	†2695	2795	3695	3995
Columbia Challenger	Rut...	6-3½x5	115	32x4	....	1195	....	†1995	1995
Columbia.....D-C&CS	Cont..	6-3¼x4½	115	32x4	1475	1475	†1475	†2295	2350
Comet.....C-53	Cont..	6-3½x5¼	125	33x4½	....	2350	2450	....	3650
Commonwealth.....44	H-S...	4-3½x5	117	32x4	....	1395	....	....	2465
Crawford.....21-6-40	Cont..	6-3½x5¼	122½	32x4	3000	3000	3000	....	4500
Crow-Elkhart....L63-65	Lyc...	4-3½x5	117	32x3½	‡1295	1295	....	....	....
Crow-Elkhart....S63-65	H-S...	6-3¼x5	117	33x4	‡1545	1545	....	....	2395
Daniels.....D-19	Own..	8-3½x5¼	132	34x4¾	‡5350	‡5350	5350	6250	6950
Davis.....61-67	Cont..	6-3¼x4½	120	32x4	†1995	1895	....	2795	2795
Dispatch	Wisc..	4-3⅜x5	120	34x4	1250	1350	1350	1525	1575
Dixie Flyer.....H-S-70	H-S...	4-3½x5	112	32x4	1445	1445	1945	2295	2345
Dodge Brothers	Own..	4-3⅞x4½	114	32x4	935	985	....	1585	1785
Dorris.....6-80	Own..	6-4 x5	132	33x5	....	†4785	4785	5800	6690
Dort.....17-12	D-Ly.	4-3½x5	108	31x4	985	985	....	1535	1685
Driggs	Own..	4-2⅝x4½	104	30x3½	1275	1275	....	....	1975
Du Pont.....A	Own..	4-3⅛x5⅛	124	32x4½	3400	†3400	....	....	4900
Durant.....A-22	Cont..	4-3⅞x4¼	109	31x4	....	890	....	1365	1365
Eicar.....K-4	Lyc...	4-3½x5	117	33x4	1195	1195	....	....	....
Eicar.....7-R	Cont..	6-3¼x4½	117	33x4	†1595	1595	‡1195	2395	2495
Elgin.....K-1	Falls..	6-3⅛x4¼	118	33x4	1595	1495	†1595	2395	2395
Essex	Own..	4-3⅞x5	108½	32x4	1375	1375	....	1880	2230
Fergus.....S-5-21	Own..	6-3¼x5	126	33x4½	....	Chassis Price		8500	....
Ferris.....C-20	Cont..	6-3½x5¼	130	32x4½	2695	....	*2595	....	3695
Ford.....T	Own..	4-3⅜x4	100	30x3½	**325	††355	....	595	660
Franklin.....9-B	Own..	6-3½x4	115	32x4	2300	2350	†2300	2850	3350
Gardner.....G	Lyc...	4-3½x5	112	32x3½	1995	995	....	....	1795
Grant.....Six	Own..	6-3½x4½	116	32x4	1550	1550	....	2450	2450
H.C.S.	Weid..	4-3⅝x5½	120	32x4½	2725	†2775	....	3450	3650
Halladay, Manh. Special	Rut...	6-3½x5	118	33x4	....	1695	....	....	....
Halladay, Craft Special	Rut...	6-3½x5	123	33x4	....	2485	....	....	....
Handley-Knight	Kn'ht.	4-4½x4½	125	32x4½	....	....	2850	....	4185
Hanson Six.....69	Cont..	6-3¼x4½	121	32x4	1795	1795	1895	†2775	2885
Harroun.....A-A-2	Own..	4-3¼x5¼	106	30x3½	....	1195	....	....	....
Hartfield.....A-42	H-S...	4-3½x5	115	32x4	†1495	1495	....	....	2395
Haynes.....75	Own..	6-3½x5⅜	132	31x4½	2685	†2485	2485	3185	3485
Haynes.....55	Own..	6-3½x5	121	3x4	1835	1785	....	....	2835
Haynes.....48	Own..	12-2¾x5	132	34x4½	4200	3635	3635	4650	4950
Holmes.....Series 4	Own..	6-3½x4¼	126	34x4½	†2950	....	2950	3850	4150
Hudson Super 6	Own..	6-3½x5	126	34x4½	†1895	....	1895	2770	2895
Huffman.....R	Cont..	6-3¼x4½	120	32x4	1845	1795	....	....	2795
Hupmobile.....Series R	Own..	4-3¼x4..	112	32x4	1485	1485	....	2400	2485
Jackson.....638	Cont..	6-3⅛x4½	121	32x4½	†2685	1950	....	3760	3760
Jordan.....M	Cont..	6-3¼x4½	120	32x4	2250	2250	....	3300	3300
Jordan.....F	Cont..	6-3½x5¼	127	32x4½	....	....	2475	....	3700
Kenworthy.....8-90	Own..	8-3 x5¼	130	32x4½	5000	5000	5250	6000	6000
Kessler.....K	Own..	4-3⅝x4¾	117	32x4	....	1995	....	....	2445
King.....J	Own..	8-3 x5	120	32x4½	2140	†2125	*2125	3125	3235
Kissel.....45	Own..	6-3 7/16x5½	124	32x4½	2075	†2975	2475	†3775	*3775
Kline Kar.....6-55-K	Cont..	6-3¼x4½	121	33x4	2090	2090	2090	3250	3290
Kurtz Automatic.....A	H-S...	6-3¼x5	122	32x4	....	2050	....	....	3000
LaFayette.....134	Own..	8-3¼x5¼	132	33x5	4850	4850	4850	6250	6500
Leach	Own..	6-3¼x5¼	134	32x4	6500	6500	....	....	....
Lexington.....Series S	Cont..	6-3¼x4½	122	32x4	....	1885	....	2750	3150
Lexington.....Series T	Anst..	6-3¼x4½	128	32x4½	....	....	2785	....	3750
Liberty.....10-C	Own..	6-3½x5	117	32x4	1595	1595	†1675	2400	2495
Lincoln	Own..	8-3⅜x5	136	33x5	†4300	4300	4300	4950	5400
Locomobile	Own..	6-4½x5½	142	35x5	....	†8600	8600	....	....
Maibohm.....B	Falls..	6-3½x4¼	116	32x4	‡1575	$1575	†1575	$2395	$2395
Marmon.....34	Own..	6-3⅜x5½	136	32x4½	4155	†3955	3955	4875	5275
Maxwell.....25	Own..	4-3⅝x4½	109	30x3½	845	845	....	1445	1545
McFarlan.....1921	Own..	6-4½x6	140	33x5	6300	†6300	6300	7500	7500
Mercer.....Series 5	Own..	4-3¾x6¾	132	32x4½	3950	†3950	*3950	5150	5650
Merit	Cont..	6-3⅜x4½	119	32x4	2245	†2245	....	....	....
Meteor.....R & RR	Dues..	4-4½x6	129	32x4½	5500	5500	....	....	....
Metz.....M6	Rut...	6-3½x5	120	32x4	1995	1995	....	2795	2895
Minchell.....F-40	Own..	6-3½x5	120	32x4	....	†1790	....	....	....
Mitchell.....F-40	Own..	6-3½x5	120	33x4	†1490	1490	....	....	....
Mitchell.....F-42	Own..	6-3½x5	127	33x4	....	....	1795	....	....
Mitchell.....F-45	Own..	6-3½x5	120	33x4	....	....	....	2290	2440
Moller.....A	Own..	4-2⅝x4	100	27x3½	2000	....	....	....	....
Monroe.....S-9 & 10	Own..	4-3¼x4½	115	32x3½	1285	1295	....	....	....
Monroe.....S-11 & 12	Own..	4-3¼x4½	115	33x4	....	....	....	2075	2175
Moon.....6-48	Cont..	6-3¼x4½	132	32x4	1735	1785	2485	2785	2785
Moon.....6-68	Cont..	6-3½x5¼	125	32x4½	....	....	2485	....	3485
Murray-Mac Six	Own..	6-3½x5½	128	34x4½	4250	4250	4250	....	....
Nash.....681-7	Own..	6-3½x5	121	33x4	1525	1545	†1695	2395	2695
Nash.....682	Own..	6-3½x5	127	34x4½	....	....	1695	....	....
Nash Four.....41-4	Own..	4-3½x5	112	32x3½	1175	1195	....	1735	1935
National Sextet.....BB	Own..	6-3½x5½	130	32x4½	2990	†2990	2990	3990	3990
Nelson.....D	Own..	4-3½x5	104	32x4	....	1750	....	....	....
Noma.....1C	Cont..	6-3½x4½	128	32x4½	2800	†2850	*3200	....	3700
Norwalk.....430-KS	Lyc...	4-3½x5	116	32x3½	....	1035	....	....	....
Oakland.....34-C	Own..	6-2 13/16x4¾	115	32x4	1665	1195	†1265	1625	1725
Ogren.....6-60	Own..	6-3½x5½	134	33x5	†3650	3750	3900	5000	5400
Oldsmobile.....43-A	Own..	4-3 13/16x5½	115	32x4	†1145	1145	....	1645	1845
Oldsmobile.....37-A	Own..	6-2 13/16x4¾	112	32x4	†1450	1450	....	2145	2145
Oldsmobile.....46	Own..	8-2⅞x4¾	122	33x4½	....	†1735	1735	....	2635
Oldsmobile.....47	Own..	8-2⅞x4¾	115	32x4	....	†1625	....	2185	2425
Overland.....4	Own..	4-3⅜x4	100	30x3½	595	595	....	850	895
Packard.....Single-Six	Own..	6-3⅜x4¾	116	33x4½	2975	2975	....	3650	3975
Packard.....Twin Six	Own..	12-3 x5	136	35x5	4850	*4850	4850	6600	6800
Paige.....6-42	Own..	6-3½x5	119	32x4	1635	1635	....	2450	2570
Paige.....6-66	Cont..	6-3⅜x5	131	33x4½	†2975	‡3295	2875	3755	3830
Pan American.E&F-6-55	H-S...	6-3⅜x5	121	33x4	2000	2000	2100	....	....
Parenti.....1921	Own..	8-2¾x4¼	125	32x4	2000	2000	....	....	3000
Paterson.....650	Cont..	6-3⅜x4½	120	33x4	....	1595	1625	2895	2895
Peerless.....56-S-7	Own..	8-3⅜x5	125	34x4½	....	2880	2880	3500	3790
Piedmont.....4-30	Lyc...	4-3½x5	116	32x3½	....	970	....	....	....
Piedmont.....6-40	Cort..	6-3⅜x4½	122	32x4	....	1285	....	....	....
Pierce-Arrow	Own..	6-4 x5½	138	33x5	7000	†6500	6500	8000	8500
Pilot.....6-45	Tector	6-3½x5	120	32x4	1995	1895	....	....	....
Pilot.....6-50	H-S...	6-3½x5	126	32x4½	2285	2285	2325	3350	3400
Porter.....40	Own..	4-5⅛x6¾	142	35x5	6750	Chassis Price		....	....
Premier.....6-D	Own..	6-3⅜x5½	126¾	33x5	3790	†3690	3890	4690	5190
Premocar.....6-40 A	Falls..	6-3½x4¼	117	33x4	1295	1295	....	....	....
Raleigh.....A-6-60	H-S...	6-3½x5	122	32x4½	2250	2250	....	3100	3200
R & V Knight.....R	Own..	4-3⅜x5	116	32x4	....	2150	....	2850	2950
R & V Knight.....J	Own..	6-3½x5½	127	32x4½	3350	†3350	3350	4000	4200
Reo Series A.....T-6	Own..	6-2¾x5	120	33x4	1650	1650	....	2700	2750
ReVere.....C	Dues..	4-4½x6	131	32x4½	4850	4650	†4650	....	6500
Roamer.....6-54-E	Cont..	6-3½x5½	128	32x4½	2750	†2650	2750	†3850	3950
Roamer.....4-75-E	Dues..	4-4½x6	128	32x4½	3850	3650	....	....	....
Rolls-Royce	Own..	6-4½x4¾	143½	33x5	U. S.	Chassis Price		11750	....
Romer	Cont..	6-3½x4½	120	33x4	2000	2000	2100	2450	2750
Saxon.....125	Own..	4-3½x5	112	32x4	1545	1495	....	2295	2295
Sayers Six.....DP	Cont..	6-3½x4½	118	33x4	1945	1945	....	....	2995
Scripps-Booth...B-39-42	Nort..	6-2½x4¾	115	32x4	†1275	1295	....	1950	2100
Scripps-Booth...F-43-46	Cont..	6-3¼x4½	115	32x4	1470	1490	....	2350	2375
Seneca.....L & O	LeR..	4-3½x4½	108	30x3½	1045	1045	....	....	....
Severin.....Six	Cont..	6-3½x5½	122½	33x4½	1485	1485	....	2100	2250
Severin.....Six	Cont..	6-3½x5½	122½	33x5	2550	2550	2550	3250	3350
Skelton.....35	Lyc...	4-3½x5	112	32x3½	995	995	....	....	....
Southern Six.....669-2	H-S...	6-3½x5	127	32x4½	2375	2395	....	....	....
Standard.....J	Own..	8-3½x5	127	34x4½	3400	†3400	3400	4500	4800
Stanley Steamer	Own..	2-4 x5	130	34x4½	2800	2600	2600	3775	3850
Stanwood Six	Cont..	6-3½x4½	118	33x4	2050	2050	....	2950	....
Stearns.....SKL4	Own..	4-3⅜x5⅝	125	34x4½	2450	2450	2675	3400	3700
Stephens.....90	Own..	6-3½x4½	122	33x4½	1900	†1985	2065	3100	3100
Stevens-Duryea.....E	Own..	6-4⅞x5½	138	35x5	7250	†6900	6800	9500	9000
Studebaker.....EJ-40	Own..	6-3½x4½	112	32x4	1125	1150	....	1850	1850
Studebaker.....EH-50	Own..	6-3½x5	119	32x4	1585	1635	†1635	2450	2550
Studebaker.....EG-60	Own..	6-3⅞x5	126	33x4½	....	....	1985	2850	2950
Stutz	Own..	4-4⅝x6	130	32x4½	3250	†3350	*3350	4800	....
Templar.....A-445	Own..	4-3⅜x5½	118	32x4	1985	1985	....	2785	2785
Texan.....A-38	Lyc...	4-3½x5	115	33x4	1195	1195	....	....	....
Texan.....C-12	H-S...	4-3½x5	115	33x4	1350	1350	....	....	....
Tulsa.....E-1-2-3	H-S...	4-3½x5	117	33x4	1285	1285	....	....	....
Tulsa.....F-1	H-S...	6-3½x5	119	33x4	1585	1585	....	....	....
Velie.....48	Cont..	6-3¼x4½	115	32x4	1585	1585	†1800	2485	2485
Velie.....34	Falls..	6-3½x4½	112	32x3½	1385	1385	....	....	2085
Vogue.....6-55	H-S...	6-3¼x5	124	32x4	....	1885	1960	2785	2885
Vogue.....6-66	Cont..	6-3½x5½	124	33x4½	....	2085	2160	2885	2985
Washington	Falls..	6-3¼x4¼	116	32x4	....	1785	....	....	....
Westcott.....C-48	Cont..	6-3¼x5¼	125	32x4½	....	2000	2090	....	3490
Westcott.....C-38	Cont..	6-3¼x4½	118	33x4	1890	1890	†1990	2890	2890
Wharton.....A	Curt..	8-4 x5	136	34x4½	....	†4885	4885	....	....
Willys Sainte Claire	Own..	8-3¼x4	121	32x4½	2875	2875	....	3750	4100
Willys-Knight.....20	Own..	4-3⅝x4½	118	33x4	1475	1525	....	2195	2395
Wirther.....61	H-S...	6-3¼x5	120	32x4½	....	....	2750	....	....
Winton.....25	Own..	6-3⅜x5½	132	35x5	4600	†4975	4600	5950	†5950

*—6-passenger. †—4-passenger. ‡—3-passenger. **—Price without starter and demountable rims. Price with starter and demountable rims $420. ††—Price without starter and demountable rims. Price with starter and demountable rims $450.

Engine Make: Anst.—Ansted. Cont—Continental. Curt—Curtiss. D.Ly—Dort Lycoming Dues.—Duesenberg. H-S—Herschell-Spillman. LeR—Leroy. Lyc—Lycoming. Nort.—Northway. Roch—Rochester. Rut—Rutenberg. Weid—Weidely. Wisc—Wisconsin.

§Model 47—31 x 4½ Tires.

Specifications of Current Motor Truck Models

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Acason	¾	$1650§	3¾x5	34x5†	34x5†	W
Acason, R	1	2260	3¾x5¼	36x3½	36x5	W
Acason, RB	1½	2485	3¾x5¼	36x3½	36x6	W
Acason, H	2½	3295	4⅜x5¾	36x4*	36x8*	W
Acason, L	3½	4295	4⅜x5¾	36x5*	36x10*	W
Acason, M	5	5250	5 x6¼	36x6	40x12	W
Ace, C	1½	2295	3¾x5¼	34x3½*	34x5*	W
Ace, A	2½	2795	4¼x5½	36x4*	36x7	W
Acme, G	¾	....	3¾x5	35x5†	35x5†	W
Acme, B	1½	....	3¾x5	34x3½	34x5	W
Acme, F	1½	....	3¾x5	34x3½	34x5	W
Acme, A	2	....	4½x5¼	36x4	36x7	W
Acme, AC	2½	....	4½x5½	35x4	36x7*	W
Acme, C	3½	....	4½x5½	33x5	40x10	W
Acme, E	5	....	4⅜x6	33x6	40x12	W
Akr'Mnulti-Trk20	1	1995	4 x5¼	31x5	31x5	B
American, 25	2½	3350	4 x6	30x4*	36x4d*	W
American, 40	4	4275	4½x6	36x5*	36x5d*	W
Apex, G	1	1450††	3¾x5	33x5†	33x5†	I
Apex, D	1½	1915	3¾x5¼	31x3½	34x4	I
Apex, E	2½	2395	4¼x5½	36x4	36x7	I
Apex, F	3½	3975	4½x6	36x5	36x10	I
Armleder, 20	1	....	3¼x5¼	31x3½*	31x5*	W
Armleder, HW	2½	....	4¼x5½	33x4*	36x7*	W
Armleder, KW	3½	....	4½x6	36x5	36x5d	W
Atco, B	1½	....	3¼x5¼	34x5†	36x6†	I
Atco, B1	1½	....	3¾x5¼	34x5†	36x6†	I
Atco, A	2½	....	4¼x5½	35x4†	36x8*	W
Atlas, M.D.	1	1550	3½x5	32x4½†	32x4½†	W
Atterbury, 20R	1½	2775	3¾x5	34x3½	34x5	W
Atterbury, 7CX	2½	3375	4½x5¼	36x4	36x4d	W
Atterbury, 7D	3½	4175	4½x5½	36x5	40x5d	W
Atterbury, 8E	5	5575	4¾x6	36x5	40x6d	W
Autocar, 21UF	1½–2	2300	4⅜x4½	34x4*	34x5*	D
Autocar, 21UG	1½–2	2400	4⅜x4½	34x4*	34x5*	D
Autocar, 26Y	....	4350	4¼x5½	31x6	36x12	D
Autocar, 26-B	....	4500	4¼x5½	34x6	36x12	D
Available, H1½	1½	2175	4 x5⅛	36x3½*	36x5*	W
Available, H2	2	2775	4 x5⅛	36x3½*	36x6*	W
Available, H2½	2½	3175	4 x5⅛	36x4*	36x8*	W
Available, H3½	3½	4175	4½x5½	36x5	40x5d	W
Available, H5	5	5375	4¾x6	36x6	40x12	W
Available, H7	7	6000	5 x6	36x6	40x14	B
Avery	1	....	3 x4	34x5†	34x5†	I
Beck, A Jr.	1	1950	3¾x5	34x3½	34x4	I
Beck, C	2	2550	4½x5½	30x4	36x6	I
Bell, M	1	1495	3⅝x5⅛	35x5	35x5†	W
Bell, E	1½	2100	3¾x5¼	34x3½	34x5†	W
Bell, O	2½	2550	4½x5½	34x4	34x6	W
Belmont, D	2	2075	3⅝x5	34x3½*	34x6*	D
Belmont, F	3½	3525	4 x6	36x5*	36x5d*	D
Bessemer, G	1	1395	3½x5	35x5†	35x5†	I
Bessemer, H-2	1½	1905	3¾x5	36x3½	36x5	I
Bessemer, J-2	2½	2595	4½x5¼	36x4	36x4d	I
Bessemer, K-2	4	3495	4½x5½	36x5	36x10	I
Bethlehem, K	1	....	3½x5	34x4½†	35x5	I
Bethlehem, G	2	....	4 x5¼	34x3½*	34x6*	I
Bethlehem, H	3	....	4 x5¼	36x4*	36x8	I
Bethlehem, J	4	....	4½x5½	36x5*	36x5d*	I
Bridgeport, A	1½	2350	3¾x5¼	34x3	34x6	W
Bridgeport, B	2½	2850	4½x5½	36x4*	36x7*	W
Bridgeport, C	3½	3350	4½x6	36x5	36x5d	W
Brinton, F	2½	3400	4½x5¼	36x4	36x7	W
Brockway, E	¾	1675	3¾x5⅛	35x5†	35x5†	B
Brockway, S-4	1½	2250	3¾x5	36x3½*	36x5*	W
Brockway, K-5	2½	3200	4½x5½	36x4	36x8	W
Brockway, R-4	3½	4100	4½x5½	36x5	36x5d	W
Brockway, T	5	4750	4¾x6	36x6	40x6d	W
Capitol, G1½	1½	2975	3¾x5	35x5	38x7	W
Capitol, H2½	2½	3700	4¼x6	33x4	33x8	W
Capitol, K2½	2½	4250	4¼x6	30x6	42x9	W
Capitol, M3½	3½	4125	4¼x6	30x5	36x10	W
Case, ††	2	3000	4¼x5¾	33x6	38x7	I
Champion Light Commercial	½	1195	3½x5	32x3½	32x3½	I
Chevrolet, G	¾	745	3½x4	31x4†	34x4½†	B
Chevrolet, T	1	1125	3½x5¼	33x4†	35x5†	W
Chicago, C1½	1½	....	3¾x5½	36x3½*	36x5*	W
Chicago, C2½	2½	....	4 x5½	36x4*	36x7*	W
Chicago, C3½	3½	....	4½x5½	36x5	36x10	W
Chicago, D5	5	....	4½x5½	36x6	40x12	W
Climber, A-20	1½	2450	3½x5	36x6*	36x7*	I
Clydesdale, 18	¾	1890	3¾x5	34x5	34x5	W
Clydesdale, 32C	1	2375	3¾x5½	34x3½*	34x5*	W
Clydesdale, 42C	1½	2475	4 x5⅛	36x3½	36x5	W
Clydesdale, 65C	2½	3250	4¾x5½	36x4	36x7	W
Clydesdale, 65EC	2½	3450	4½x5½	36x4	36x7	W
Clydesdale, 90C	3½	4100	4½x5½	36x5	40x10	W
Clydesdale, 120C	5	4500	4¾x6	36x6	40x12	W
Collier, 18	1	2350	3¾x5	34x4	34x5	W
Collier, 19	1½	2550	3¾x5	36x4	36x6	W
Collier, 21	2	2950	4½x5¼	36x4	36x7	W
Collier, 22	2½	3250	4½x5¼	36x4	36x4	W
Columbia, H	1½	2350	3¾x5	35x5†	34x5	I
Columbia, G	2½	2350	4 x5¼	36x4	36x7	I
Comet	1½	1950	3¾x5	34x4	34x4	W
Commerce, T	¾–1½	1450	3¾x5	34x4½†	34x4½†	B
Commerce, 12	1½	1800	3¾x5	35x5†	35x5†	I
Commerce, 15	2	2150	3¾x5	35x5†	35x6†	I
Concord, A	1½	3150	4 x5½	36x3½	36x6	W
Concord, B	2½	3600	4¼x5½	36x4	36x8	W
Concord, AX	1½	3250	4 x5½	36x3½	36x6	W
Concord, BX	2½	3600	4½x5½	36x4	36x8	W
Cook, 41	2	3000	4 x5½	36x6†	38x7†	I
Corbitt, H	¾–1	1800	3¾x5	35x5†	35x5†	B
Corbitt, E	1	2200	3¾x5	34x3½	34x4	W
Corbitt, D	1½	2600	3¾x5	36x3½	36x5	W
Corbitt, C	2	3150	4¼x5¼	36x3½	36x7	W
Corbitt, B	2½	3300	4¼x5¼	36x4	36x7	W
Corbitt, A	3½	$4100	4½x5½	36x5	36x10	W
Corbitt, AA	5	5000	4¾x6	36x6	40x6d	W
Cyclone, A	1½	2685§	3½x5	34x5†	36x6†	I
Dart, S	1½	....	3¾x5⅛	34x3½	34x6	W
Dart, M	2½	....	4¼x5½	30x4	36x7	W
Dart, W	3½	....	4½x6	36x5	36x10	W
Day-Elder, A	1	2100	3¾x5	34x3½	34x4	W
Day-Elder, B	1½	2300	3¾x5	34x3½	34x5	W
Day-Elder, D	2	2750	4½x5¼	36x4	36x7	W
Day-Elder, C	2½	3025	4½x5½	36x4	36x7	W
Day-Elder, F	3½	3750	4½x5½	36x5	36x5d	W
Day-Elder, E	5	4250	4½x6	36x5*	40x6d*	W
Dearborn, E	1	1700	3⅝x5⅛	35x5†	35x5†	W
Dearborn, FX	1½	2300	3¾x5½	34x4	34x5	W
Dearborn, F	1½	2180	3¾x5⅛	34x4*	34x5*	W
Defiance, 48	2	2590	3¾x5⅛	35x5†	34x7†	W
Defiance, G	1	1695§	3¾x5	35x5†	35x5†	I
Defiance, D	1½	2095§	3¾x5	35x5†	36x6†	I
Defiance, E	2	2275§	3¾x5	35x5†	38x7†	W
DeKalb, E2½	2	2600	4½x5½	36x4*	36x6*	W
DeKalb, E2	2½	2250	4½x5¼	34x3½*	36x5*	W
DeMartini, 1½	1½	2600	3¾x5	34x3½	34x6	W
DeMartini, 2	2	3300	4 x5½	36x3½	36x7	W
DeMartini 3	3	4250	4¼x5½	36x4	36x10	W
DeMartini 4	4	4800	4½x6	33x5	36x12	W
Denby, 31	¾	1625	3½x5	35x5	35x5	B
Denby, 33	1½	2300	3¾x5	35x5†	38x7†	I
Denby, 34	2	2600	3¾x5	36x3½	36x6	I
Denby, 25	3	3300	4½x5¼	36x4	36x7	I
Denby, 27	4	4200	4½x5½	36x5	36x5d	I
Denby, 210	5	4850	4½x5½	36x6	40x6d	I
Dependable, A	¾–1	1650	3⅝x5½	34x5	36x6	W
Dependable, C	1½	2350	3¾x5¼	34x3½	34x5	W
Dependable, D	2	2650	4 x5½	34x5	36x6	W
Dependable, E	2½	2950	4¼x5½	36x4	36x7	W
Dependable, G	3½	3550	4½x6	36x6	38x7	W
Diamond T, O	1	2500	3¾x5¼	34x5†	36x6†	W
Diamond T, FS	1½	2960	3¾x5¼	36x3½	36x5	W
Diamond T, T	1½	2650	3¾x5¼	36x3½	36x5	W
Diamond T, U	2	3285	4 x5¼	36x4	36x7	W
Diamond T, K	3½	4675	4¼x5½	36x5	36x5d	W
Diamond T, EL	5	5400	4½x5½	36x6	40x6d	W
Diamond T, S	5	5650	4¾x6	36x6	40x6d	W
Diehl, A	1	....	3½x5	34x4½	35x5	I
Diehl, B	1½	....	3½x5	36x6	36x6	I
Dispatch, F	1	1350	3¾x5	34x4†	34x4†	C
Doane	2½	4100††	4¼x5¾	36x5	36x7	C
Doane	3½	5100††	4⅜x5¾	36x5	36x5d	C
Doane	6	6000††	5 x6½	36x6	40x6d	C
Dodge Brothers	½	885	3⅞x4½	33x4†	33x4†	B
Dorris, K-4	2–2½	3400	4¼x5½	36x4	36x7	W
Dorris, K-7	3½	4100	4¼x5½	36x5	36x10	W
Double Drive B	3	4000	4¼x5½	6	6	W
Douglas G	1½	2050	3¾x5⅛	36x5	37x8*	W
Douglas I	3	3250	4¼x5½	36x6	37x8*	W
Duplex, A	1½	2775	4 x5¼	35x5†	38x7†	W
Duplex, E	3½	4250	4¼x5½	36x8	36x8	I
Duty, 21	2	1490	3½x5	34x3½	34x5	I
Eagle, 100-2	2	2275	3¾x5¼	34x4*	34x7*	I
Erie, E	1½	....	3¾x5¼	36x6†	36x6†	W
Erie, A	2½	....	4¼x5½	36x4	36x4d	W
F.W.D., B	3	4200	4¾x5½	36x6	36x6	B
Facto, 1921	2½	2895§	4¼x5½	36x4*	36x8*	W
Fageol, 1½	1½	3000	3¾x5¼	34x3½*	34x6*	W
Fageol, 2½	2½	3900	4¼x5¾	34x4	36x7	W
Fageol, 3½	3½	5000	4½x6¼	36x5*	40x5d*	W
Fageol, 5	5	5700	4½x6¼	36x6	40x6d	W
Famous, B10	1	1800	3½x5	36x3½*	36x4*	I
Famous, B12	1½	2100	3¾x5	36x3½*	36x5*	I
Farge, R	2	2500	3¾x5	30x4	36x6	W
Federal, SD	1	2500	3¾x5	35x5†	36x6†	W
Federal, TE	1½	2725	4½x5¼	36x3½	36x5	W
Federal, UE	2	3025	4½x5¼	36x4	36x7	W
Federal, WE	3½	3950	4½x5½	36x5	36x5d	W
Federal, X2	5–6	5350	4¾x6	36x6	40x6d	W
Ford, TT	1	415	3¾x4	30x3½*	32x4½*	W
Forschler, A	1	....	3½x5	34x3	34x4	W
Forschler, AX	1½	....	3½x5	36x3½	36x5	W
Forschler, B	2	....	4½x5½	33x4	36x7	W
Forschler, BX	3	....	4½x5½	36x4	36x8	W
Front Drive C	1½	2900	3⅝x5½	5	4	W
Fulton, A	¾	1750	3½x5	35x5†	35x5†	B
Fulton, C	2	2350	3½x5	34x4	34x6	I
G & J**	2	3850	4x5¼	36x4	36x7	W
G & J**	3½	5175	4½x5½	36x5	36x5d	W
G.M.C., K16	1	1495	3½x5½	31x5†	34x5†	B
G.M.C., K41 A	2	3000	4 x5½	36x4*	36x7*	W
G.M.C., K71 A	3½	4250	4½x6	33x5	40x5d	W
G.M.C., K101A	5	4650	4½x6	33x5	40x6d	W
G.W.W.	1½	2100	3¾x5½	35x5	35x5	I
Garford, 15	¾	1500	3⅝x5½	34x5†	34x5†	W
Garford, 25	1¼	2090	3¾x5½	30x3½	36x4	W
Garford, 73-H	2	3190	4¼x5½	36x4	36x7	W
Garford, 68D	5	5200	5 x6½	36x6	40x6d	W
Garford, 77D	3½	4390	4½x6	36x5	36x6d	W
Garford, 150-A	7½	5500	5x6½	36x6	40x7d	C
Gary, F	1	2100	3¾x5	33x3½	36x4	W
Gary, I	1½	2550	4 x5½	36x3½	36x5	W
Gary, J	2½	$3150	4½x5½	36x4	36x7	W
Gary, K	3½	4050	4½x6	36x5	40x5d	W
Gary, M	5	5150	5 x6½	36x6	40x6d	W
Gersix, M	1½	3100	4 x5½	36x3½	36x7	W
Gersix, K	2½	3500	4½x5½	36x4	36x8	W
Gersix	3½	4500	4½x6	36x5	40x12	W
Giant, 15-A	1½	2250	3¾x5	34x3½	34x5	W
Giant, 16	2	3050	4¼x5¼	36x4	36x7	W
Giant, 17	3½	4150	4½x5½	36x5	36x5d	W
Golden West, GH	3	5000	4½x6	36x7	36x7	W
Golden West, G	3½	4500	4½x5½	36x6	36x6	W
Golden West, H	3½–4	5000	4½x6	36x6	36x6	W
Golden West, T	4	5500	4¾x6	36x6	36x6	W
Golden West, K	7	6000	5½x6	36x6	36x6	W
Golden West, HA	7	6000	4½x6	36x6	36x10	W
Graham Bros. A	1½	2495	3¾x5	35x5†	36x6†	I
Gramm-Bern., 10	1	1495§	3½x5	33x5†	33x5†	B
Gramm-Bern., 15	1½	2050§	3¾x5	36x3½*	36x5*	I
Gramm-Bern., 65	1½	2725§	3¾x5	36x3½*	36x5	W
Gramm-Bern., 20	2	3175§	4½x5¼	36x4*	36x7*	W
Gramm-Bern., 25	2½	3575§	4½x5½	36x4*	36x7d*	W
Gramm-Bern., 35	3½	4375§	4½x5½	36x5	40x5d*	W
Gramm-Bern., 50	5	5275§	4¾x6	36x6	40x6d*	W
Hahn, J4	1	....	3¾x5	34x5*	34x5*	W
Hahn, CD	1½	....	4¼x5¼	36x3½*	36x6*	W
Hahn, EE	2½	....	4½x5½	36x4*	36x8*	W
Hahn, F	3½	....	4½x5½	36x5*	36x10*	W
Hahn, EF	5	....	4¾x6	36x6	40x12	W
Hal. Fur, E	1	2350	4 x5	35x5†	35x5†	W
Hal. Fur, B	2½	3250	4¼x5½	35x5*	38x7*	W
Hal. Fur, F	3½	4250	4½x5½	36x6†	40x10†	W
Hall	1½	3100	3¾x5	34x5†	38x7†	W
Hall	2½	3275	4½x5¼	36x4	36x6	W
Hall	3½	4100	4½x5½	36x5	36x5d	W
Hall	5	5100	4½x5½	36x5	40x6d	W
Hall	7	5100	4½x5½	36x5	40x6d	C
Harvey, WEA	1½	2550	4½x5½	34x3½	34x5	W
Harvey	2	2950	4¼x5½	34x4	34x7	W
Harvey, WFA	2½	3300	4¼x5½	36x4	36x7	W
Harvey, WHA	3½	3950	4½x6	36x5	36x5d	W
Harvey, WKA	5	4500	4½x6	36x6	40x6d	W
Hawkeye, K	1½	1850	3¾x5¼	34x3½*	34x5*	I
Hawkeye, M	2	2650	4¼x5½	36x4*	36x6*	I
Hawkeye, N	3½	3700	4½x6	36x5*	36x10*	I
Hendrickson, N	2½	3150	4¼x5¾	36x4*	36x7*	W
Hendrickson, M	3½	3975	4¼x5¾	36x5*	36x5d*	W
Highway, Knight A	4	....	4 x6	36x5	36x6d	W
Highway, Knight B	5	....	4 x6	36x5	40x6d	W
Higrade, A17	¾	1850	3½x5	32x4½	32x4½	W
Higrade, A18	1	2100	3½x5	35x5†	35x5†	W
Higrade, B20	1½	2500	4½x5¼	35x4†	36x6†	W
Huffman, B	1½	1995	3¾x5	34x3½	34x6	W
Huffman, C	1½	1795	3¾x5¼	34x3½	34x6	I
Hurlburt	1½	....	4 x5½	34x4	34x5	W
Hurlburt	2½	....	4½x5½	36x4	36x4d	W
Hurlburt	3½	....	4½x6	36x5	36x5d	W
Hurlburt	5	....	4½x6	36x5	40x6d	W
Huron Erie	1½	2425	3¾x5¼	36x3½	36x5	I
Huron Mich.	2½	2950	4¼x5½	36x4	36x7	I
Indep'd't(Iowa), D	1	1665	3½x5	34x3½	34x4	W
Indep'd't(Iowa), G	1½	2040	3¾x5¼	34x3½	34x5	I
Indep'd't(Ia.), H.I	2½	2940	4½x5¼	34x4	34x6	I
Indep'd't(Ohio), F	1½	2585	3¾x5	36x3½	36x5	W
Indep'd't(Ohio), H	2½	2985	4½x5¼	36x4	36x4d	W
Indep'd't(Ohio), K	3½	3985	4½x5½	36x5	36x5d	W
Indiana, 12	1¼	2290	3¾x5¼	34x3½*	34x5*	W
Indiana, 20	2	2950	4½x5½	36x4*	36x7*	W
Indiana, 25	2½	3150	4½x5½	36x4*	36x8*	W
Indiana, 35	3½	3750	4¾x5½	36x5*	36x5d*	W
Indiana, 51	5	4795	5 x6¼	36x5*	40x6d*	W
Inland, D	2	2950	4 x5	34x5	34x6	I
International, S	¾	1500	3½x5	34x5†	34x5†	I
International, 21	1	1750	3½x5¼	36x3½	36x3½	I
International, 31	1½	1850	3½x5¼	36x3½	36x4	I
International, 41	2	2100	3½x5¼	36x3½	36x5	I
International, 61	3	2400	4½x5	36x4	36x6	I
International, 101	5	3600	4½x5	36x5	40x10	I
J & J, D	2	3250	4 x5	34x4*	34x6	I
Jackson, 4WD	3½	3850	4½x5½	36x7	36x7	B
Jumbo, 15	1½	2425	3¾x5¼	36x3½	36x5	I
Jumbo, 20	2	2675	3¾x5¼	35x5†	38x7†	I
Jumbo, 25	2½	3090	4½x5½	36x4	36x7	I
Jumbo, 30	3	3590	4¼x5½	36x6†	42x9†	I
Jumbo, 35	3½	4030	4½x6	36x5	36x10†	I
Jumbo, 40	4	4730	4½x6	36x7†	44x10	I
K-Z, 1	1	2250	3½x5	34x3½	34x5	W
K-Z, 1½	1½	2750	3¾x5	36x4	36x6	W
K-Z, 2½	2½	3250	4½x5¼	36x4	36x8	W
K-Z, 3½	3½	4250	4½x5½	36x5	40x10	W
K-Z, 5	5	5200	4½x5½	36x6	40x6d	W
Kalamazoo, G-1	1½	2495	3¾x5	34x4	34x5	W
Kalamazoo, G-2	1½	2800§	3¾x5	36x5	36x6	W
Kalamazoo, H	2½	3275§	4 x6	36x4	36x8	W
Kalamazoo, K	3½	4000§	4½x6	36x5	36x10	W
Kalamazoo K-5	5	4500§	4½x6	36x6	36x6d	W
Karavan, A	2½	3900	4¼x6	36x4	36x8	W
Kearns, H	¾	1600	3¼x4½	32x4½†	32x4½†	I
Kearns, N	1½	2200	3½x5	34x3½	34x6	I
Kelly-S, K-31*	1½	2900	3¾x5¼	36x3½	36x6	C
Kelly-S., K-34	1½	2900	3¾x5¼	36x3½	36x6	W
Kelly-S., K-38	2½	3250	3¾x5¼	36x4	36x4d	W
Kelly-S., K-35	2½	3250	3¾x5¼	36x4	36x4d	C
Kelly-S., K-40	3½	4200	4½x6½	36x5	40x5d	C
Kelly-S., K-41	3½	4200	4½x6½	36x5	40x5d	I
Kelly-S., K-42	3½	4200	4½x6½	36x5	40x5d	W

*2-cyl. †6-cyl. ‡8-cyl. All others, not marked, are 4-cyl. Trac., Tractor. **Canadian made.

Final Drive: W—Worm, I—Internal Gear, C—Chains, D—Double Reduction, B—Bevel, 4—Four-Wheel, E—External Gear. *Tires—optional. †Pneumatic Tires. All others solid. ††Price includes body. §—Price includes several items of equipment.

*Kelly-Springfield.

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Kelly-S., K-45	4	$4550	4½x6½	36x5	40x6d	C
Kelly-S., K-50	5	4900	4½x6½	36x6	40x6d	C
Kelly-S., K-60	6	5100	4½x6½	36x6	40x7d	C
Keystone, 40	2	2450	3⅝x5⅛	34x5†	38x7†	I
Kimball, AB	2	3675	4 x6	36x4	36x7	W
Kimball, AC	2½	3975	4½x6	36x4	36x8	W
Kimball, AK	3	4500	4½x6	36x4	36x10	W
Kimball, AE	4	5000	4¾x6	36x5	40x12	W
Kimball, AF	5	5975	5 x6	36x6	40x7d	W
Kissel, Express	1	1985††	3⅞x5½	34x5†	34x5†	W
Kissel, Utility	1½	2775	3⅞x5½	36x3½	36x5	W
Kissel, Freighter	2½	3475	4¼x5½	36x4	36x7	W
Kissel, H. D.	4	4475	4¼x5½	36x5	36x5d	W
Kleiber, AA	1	2600	4½x5¼	34x3½*	34x5*	W
Kleiber, A	1½	3100	4½x5¼	36x3½*	36x6*	W
Kleiber, BB	2	3600	4½x5¼	36x4*	36x7*	W
Kleiber, B	2½	3950	4½x5½	36x5*	36x8	W
Kleiber, C	3½	4600	4½x5½	36x5	36x5d	W
Kleiber, D	5	5300	5 x6½	36x6	40x12	W
Koehler, D	1½	1885	3½x5	34x3½	34x5	W
Koehler, M	2½	2875	4 x5⅛	36x4	36x7	W
Koehler, MCS	2½	2975	4 x5⅛	36x4	36x7	W
Koehler, F	3½	3985	4½x5½	36x5	36x10	W
Koehler, MT, Trac	5	2975	4 x5⅛	36x4	36x7	W
L.M.C., 2-20	2½	2540	4½x5¼	36x4	36x4d	I
Lange, B	2½	3350	4½x5¼	36x4*	36x6*	C
Larrabee, XZ	¾–1	1925	3¼x4½	34x5†	34x5†	B
Larrabee, U	1½	2400	3¾x5	34x3½	34x5	W
Larrabee, SK	2½	3200	4½x5¼	36x4	36x7	W
Larrabee, FL	3½	4000	4½x5½	36x5	36x5d	W
Larrabee, FW	5	4800	4½x6	36x6	40x6d	W
Lien, L	1	2350	3¾x5⅛	35x5†	35x5†	W
Luedinghaus, C	1	2100	3½x5	35x5†	35x5†	W
Luedinghaus, W	1½	2700	3¾x5¼	34x3½*	34x5*	W
Luedinghaus	2–2½	3150	4¼x5¾	36x4*	36x7*	W
Maccar, L	1½	2925	4½x5¼	36x4	36x6	W
Maccar, H-2	2½	3650	4½x5½	36x4	36x4d	W
Maccar, M-2	3½	4500	4½x6	36x5	36x5d	W
Maccar, G	5	5500	4¾x6	36x5	40x6d	W
MacDonald, A	7½	5750	4½x6	40x7	40x14	I
Mack, AB D.R.	1½	3150	4 x5	36x4	36x3½d	D
Mack, AB	2½	3400	4 x5	36x4	36x4d	C
Mack, AB Chain	1½	3000	4 x5	36x4	36x3½d	C
Mack, AB Chain	2	3300	4 x5	36x4	36x4d	C
Mack, AB D.R.	2	3750	4 x5	36x4	36x4d	D
Mack, AC Chain	3½	4950	5 x6	36x5	40x5d	C
Mack, AC Chain	5	5500	5 x6	36x6	40x6d	C
Mack, AC Chain	6½	5750	5 x6	36x6	40x12	C
Mack, AC Chain	7½	6000	5 x6	36x7	40x7d	C
Mack Trac, AB	5	3100	4 x5	36x4	36x4d	C
Mack Trac., AC	7	4950	5 x6	36x5	40x5d	C
Mack Trac. AC	10	5530	5 x6	36x6	40x6d	C
Mack Trac., AC	13	5750	5 x6	36x6	40x12	C
Mack Trac., AC	15	6000	5 x6	36x7	40x7d	C
Mapleleaf, AA**	2	4150	4 x5¼	36x4	36x7	W
Mapleleaf, BB**	3	4775	4¼x5½	36x4	36x4d	W
Mapleleaf, CC**	4	5770	4½x5½	36x5	36x5d	W
Mapleleaf, DD**	5	6825	4½x5½	36x6	40x6d	W
Master, JW	1½	2690	4½x5½	34x3½	34x5	W
Master, W	2½	3290	4¼x5½	34x4	36x7	D
Master, D	2½	3540	4¼x5½	34x4	36x7	D
Master, A	3½	4190	4½x6	36x5	40x5d	W
Master, E	3½	4640	4½x6	36x5	40x5d	D
Master, B	5	5290	4¾x6½	36x6	40x6d	W
Master, F	5	5440	4¾x6½	36x6	40x6d	D
Master Trac., T	6	3740	4¼x5½	34x4	36x7	D
Maxwell, 1½	1½	1332	3⅝x4¼	32x3	32x4	W
Menominee, HT	1	2080	3¾x5	34x3½	36x5	W
Menominee, H	1½	2725	4 x5	36x3½	36x5	W
Menominee, D	2	3215	4 x6	36x4	36x8	W
Menominee, G	3½	4270	4½x6	36x5	36x10	W
Menominee, J3	5	5150	4¾x6	36x6	40x12	W
Moline, 10	1½	2150	3½x5	34x5†	36x6†	I
Moreland, 20N	1	2850	3¾x5	35x5†	35x6†	I
Moreland, 21B	1½	2800	4½x5¼	36x3½	36x6	W
Moreland, 21C	2½	3500	4½x5½	36x4	36x8	W
Moreland, 21H	3½	4600	4¾x6	36x5	40x5d	W
Moreland, 21J	5	5000	4¾x6	36x6	40x6d	W
Napoleon, 79	¾–1	1350	3½x5	38x4	33x11†	I
Napoleon, XX-7	1	1535	3½x5	35x5*	35x5*	I
Napoleon, 11	1½	1860	3½x5	35x5*	36x6*	I
Nash, 2018	1	1895	3¼x5¼	35x5	36x6	I
Nash, 3018	2	2550	3¾x5¼	36x6	40x8	I
Nash, Quad.	2	3250	4¼x5½	40x8	40x8	I
*Nelson, F1½	1½	....	4½x5¼	36x3½	33x5	W
*Nelson, F2	2	....	4½x5¼	36x4	36x7	W
*Nelson, F3½	3½	....	4½x5½	36x5	33x5d	W
*Nelson, FC5	5	....	4¾x6	36x6	40x6d	W
Netco, D	2	3100	4½x5¼	36x4*	36x7*	W
Netco, H	2½	3500	4½x5½	36x4*	36x8*	W
New York, M	1½	....	4½x5¼	36x3½	33x5	W
New York, N	2–2½	....	4½x5¼	36x4	36x4d	W
Niles, E	2	3000	4½x5¼	36x4*	36x7*	W
Noble, B30	1½	2400	3¾x5¼	36x3½	36x5	W
Noble, C40	2	2675	4 x5½	36x4	36x7	W
Noble, D50	2½	2950	4¼x5½	36x4	36x8	W
Noble, E70	3½	3800	4½x6	36x5	36x10	W
Northwestern W	1½	2750	4½x5¼	34x4	36x6	W
Northwestern WS	2½	3500	4½x5½	36x4	36x8	W
Norwalk, 25E	1	1695	3½x5	34x3½	34x4	W
Norwalk, 35E	1½	2025	3½x5	34x3½	34x3½d	W
Norwalk, 35E Spec	1½	2285	3¾x5¼	34x3½	34x5	W
O. K., K1	1½	2675	4 x5½	36x3½	36x5	W
O. K., L1	2½	3150	4¼x5½	36x4	36x8	W
O. K., M1	3½	4250	4½x6	36x5	36x5d	W
Ogden, A1	1½	2350	3¾x5	36x3¼	36x5	W
Ogden, E	2½	$3250	4½x5¼	36x4	36x7	W
Old Hickory, W	1	2175	3¾x5	36x3½*	36x4*	W
Old Reliable, A	1½	2350	4 x5	34x4	36x6	W
Old Reliable, B	2½	3500	4¼x6	34x4	36x4d	W
Old Reliable, C	3½	4250	4¼x6	36x5	36x5d	W
Old Reliable, D	5	5250	4¾x6	36x6	40x6d	W
OldReliable, KLM	7	6000	4¾x6¼	36x6	40x7d	C
Oldsmobile Econ.	1	1095	3½x5¼	35x5†	35x5†	I
Olympic, A	2½	3500	4¼x5½	36x4	36x7	W
Oneida, A-9	1¼	2350	3⅝x5½	36x3½	36x5	W
Oneida, B-9	1¾	2915	4 x5¼	36x4	36x7	W
Oneida, C-9	2½	3390	4 x5¼	36x4	36x7	W
Oneida, D-9	3½	4345	4½x5½	36x5	36x10	W
Oneida, E-9	5	5160	4½x5½	36x6	40x12	W
Oshkosh, A	2	3750	3½x5	36x6†	36x6†	4
Oshkosh, AA	2	3850	3½x5	36x6†	36x6†	4
Oshkosh, B	2½	4150	4 x5¼	38x7†	38x7†	4
Oshkosh, BB	2½	4300	4 x5⅛	38x7†	38x7†	4
Packard, EC	....	3500	1¼x5½	36x4	36x7	W
Packard, ED	....	4100	4½x5½	36x5	36x5d	W
Packard, EF	....	4500	5 x5½	36x6†	40x6d†	W
Packard, EX	....	4000	4¼x5½	36x6†	40x8†	W
Paige, 52–19	1½	2880	4 x5¼	34x3½	34x5	W
Paige, 54–20	2½	3100	4¼x5½	34x4	34x8	W
Paige, 51–18	3½	4285	4½x5½	36x5	36x5d	W
Parker, F20	2	3500	4 x6	34x4	36x4d	W
Parker, J20	3½	4400	4½x6	36x5	40x5d	W
Parker, M20	5	5500	4¾x6	36x6	40x6d	W
Patriot, Revere	¾	1785	3⅜x5	35x5†	35x5†	W
Patriot, Lincoln	1½	2450	4 x5¼	34x3½*	34x5*	W
Patriot, Washgt'n	2½	3150	4½x5½	36x4*	36x7*	W
Piedmont, 4-30	1½	1685	3½x5	31x4†	31x4†	W
Pierce-Arrow	2	3200	4 x5½	36x4	36x4d	W
Pierce-Arrow	3½	4350	4½x6¾	36x5	36x5d	W
Pierce-Arrow	5	4850	4½x6¾	36x5	40x6d	W
Pioneer, 59	1	1550	3¾x4¼	32x4½†	32x4½†	W
Pittsburger, C-21	2½–3	3500	4½x5¼	36x5*	36x7*	W
Pony	¼	400	2¾x4	28x3†	28x3†	C
Power, F	1½	....	3⅜x5¼	36x6	36x6	W
Power, C	3½	....	4½x5½	36x5	40x10	W
Premocar, B-143	1½	2475	3½x5	36x6†	36x6†	W
Rainier, R-11	¾	2150	3½x5	35x5†	35x5†	W
Rainier, R-19	1	2350	3½x5	31x3½	31x4	W
Rainier, R-16	1½	2600	3¾x5	34x3½	34x5	W
Rainier, R-18	2	2950	4½x5¼	34x4	34x6	W
Rainier, R-20	2½	3600	4½x5¼	34x4	31x7	W
Rainier, R-15	3½	4500	4½x5½	36x5	36x5d	W
Rainier, R-17	5	5250	4½x6	36x6	36x6d	W
Ranger, TK-20-2	2	....	3⅜x5	36x6†	36x6†.	W
Reo, F	¾–1½	1385	4½x4½	34x4½†	31x4½†	B
Reliance, 10A	1½	2400	4 x5½	36x3½	36x5	I
Reliance, 20B	2½	3100	4½x5½	36x4	36x4d	I
Republic, 75	¾	1395††	3½x5	32x4½	32x4½	I
Republic, 10	1	1695	3¾x5	35x5†	35x5†	I
Republic, 10Exp.††	1	2095	.....	35x5†	35x5†	I
Republic, 11X	1½	2295	3¾x5	34x3½	31x5	I
Republic, 19	2½	2795	4½x5¼	36x4	36x7	I
Republic, 20	3½	3845	4½x5½	36x5	36x10	I
Rowe, CW	1½	3000	3¾x5	30x6†	36x6†	W
Rowe, C. D. W.	2	3300	4 x5	34x4	36x3½d	W
Rowe, G. S. W.	3	4150	4 x6	31x5	36x5d	W
Rowe, G. P. W.	3	5250	3½x5‡	38x7†	42x9†	W
Rowe, HW	4	4500	4½x6	36x5	36x6d	W
Rowe, F. W.	5	5500	4½x6	36x6	40x6d	W
Rumely, A	1½	2720	3¾x5¼	36x3½	36x5	W
Samson, KO 15	¾	865	3¼x4	32x4	32x4	B
Samson, E 25	1¼	1395	3½x5½	35x5	35x5	B
Sandow, G	1	2295	3¾x5	34x3½	34x5	W
Sandow, CG	1½	2590	3¾x5	31x4	31x6	W
Sandow, J	2½	3275	4½x5¼	36x4	36x7	W
Sandow, M	3½	4295	4½x5½	36x5	36x5d	W
Sandow, L	5	4975	4½x5½	36x6	40x6d	W
Sanford, 25	2½	3350	4½x5¼	36x4	36x4d	W
Sanford, 35	3½	4200	4½x5½	36x5	36x5d	W
Sanford, 50	5	5100	4¾x6	36x5	40x6d	W
Schacht, 2-Ton	2	....	4¼x5½	36x4	36x7	W
Schacht, 2½-Ton	2½	....	4¼x5½	36x4	36x4d	W
Schacht, 3½-Ton	3½	....	4¼x6	36x5	36x5d	W
Schacht, 5-Ton	5	....	4½x6	36x5	40x6d	W
Schwartz, A	1	1685	3½x5	33x4½†	33x4½†	B
Schwartz, BW	1½	2600	3¾x5¼	34x3½*	34x7*	W
Schwartz, C.W.S.	2½	3200	4¼x5½	36x4	36x8	W
Schwartz, DW	5	4900	4½x6	36x6	40x12	W
Selden, 1½A	1½	2360	3¾x5	31x3½	34x5	W
Selden, 2½A	2½	3425	4½x5¼	36x4	36x7	W
Selden, 3½A	3½	4175	4½x5½	36x5	36x10	W
Selden, 5A	5	5600	4¾x6	36x6	40x12	W
Seneca, M	½	1020	3½x4½	30x3½†	30x3½†	B
Service, 15	¾–1	1810	3⅜x5	34x4½	35x5	B
Service, 220	1	2115	3½x5½	34x3½	34x5	W
Service, 31	1½	2985	4 x5½	36x3½	36x6	W
Service, 36	1½	3115	4¼x5½	35x5†	38x7†	W
Service, 51	2½	3175	4½x5½	36x4	36x7	W
Service, 71	3½	4285	4½x5½	36x5	36x5d	W
Service, 76	3½	4485	4½x6	36x5	36x5d	W
Service, 161	5	5275	4½x6	36x6	40x6d	W
Signal, NF	1	$2475	4¾x5	34x5†	36x6†	W
Signal, H	1½	2925	4½x5¼	34x4	36x6	W
Signal, J	2½	3275	4½x5¼	34x4	36x8	W
Signal, M	3½	4275	4½x5½	36x5	40x5d	W
Signal, R	5	5300	4¾x6	36x6	40x6d	W
Southern, 10	1	2090	3¾x5	34x3½	34x4	W
Southern, 15	1½	2590	3¾x5¼	36x6†	34x4	W
Southern, 20	2	2990	4¾x5¼	36x6†	40x8*	W
Standard, 1-K	1–1½	1800	3¾x5	34x3½*	34x5*	W
Standard, 76	2½–3	2090	4½x5¼	36x1*	36x7*	W
Standard, 66	3½–4	2800	4½x5½	36x5	36x10	W
Standard, 5-K	5–7	4400	4¾x6	36x6	40x12	W
Sterling, 1½	1½	3200	4 x5¾	36x3½	36x5*	W
Sterling, 2	2	3500	4 x5¾	36x4	36x6	W
Sterling, 2½	2½	3650	4⅜x5¾	36x4*	36x4d*	W
Sterling, 3½	3½	4650	4½x6¼	36x5*	40x5d*	W
Sterling, 5-W	5	5500	5 x6¼	36x6*	40x6d*	W
Sterling, 5-C	5	6000	5 x6¼	36x6	40x6d	C
Sterling, 7½	7½	6500	5 x6¼	36x6	40x7d	C
Stewart, 14	¾	1395	3⅝x5⅛	32x4½†	32x4½†	I
Stewart, 15	1	1875	3½x5	35x5†	35x5†	I
Stewart, 9	1½	2200	3¾x5	34x3½	34x5	I
Stewart, 7	2	2800	1½x5¼	31x4	34x7	I
Stewart, 7-X	2½	2950	1¼x5½	31x4	34x7	I
Stewart, 10	3½	3350	1½x5½	36x5	36x5d	I
Stewart, 10-X	3½	3350	4½x6	36x5	36x5d	I
Stoughton, A	1	1905	3¾x5¼	31x4½†	35x5†	W
Stoughton, B	1½	2350	3¾x5¼	36x3½	36x5	W
Stoughton, C	¾	1240	3½x5	34x4½†	34x4½†	W
Stoughton, D	2	2800	4 x5½	36x4	36x7	W
Stoughton, F	3	3300	4¼x5½	36x5d	36x5d	W
Sullivan, E	2	3350	4½x5½	36x1*	36x7*	W
Sullivan, H	3½	4650	4½x6	36x5	36x5d	W
Superior, D	1	1650	3¾x5	31x4½†	31x1	I
Superior, E	2	2600	1½x5¼	36x4	33x6	I
Super Truck, 50	2½	3300	4 x6	36x4	36x8	W
Super Truck, 70	3½	4300	4¼x6	36x5	40x5d	W
Super Truck, 100	5	5300	4¾x6	35x5	40x12	W
Super Truck, 150	7½	6300	5 x6	36x6	40x7d	W
Texan, A38	¾	1095	3½x5	33x4	33x4	I
Texan, TK39	1½	1550	3½x5	36x6	38x7	W
Tiffin, GW	1½	2100	4½x5¼	36x3½	36x5	W
Tiffin, MW	2½	3100	4½x5¼	36x4	36x3½d	W
Tiffin, PW	3½	4100	4½x5½	36x5	40x5d	W
Tiffin, F50	5	4800	4¾x6	36x6	40x6d	W
Tiffin, F60	6	5000	4¾x6	36x6	40x12	W
Titan, HT	3½	4550	4½x6	34x4*	40x5d	I
Titan, HD	5	5400	4½x6	36x5	40x6d	I
Titan, TS	2½	3400	4¼x5½	34x4*	36x6d	I
Tower, J	1½	3000	4½x5¼	35x5	38x7	W
Tower, H	2½	3175	4½x5¼	36x4	36x7	W
Tower, G	3½	4100	4½x5½	36x5	36x5d	W
Traffic, C	....	1595	3¾x5	34x3½*	34x5*	I
Traffic	3	1895	3¾x5	36x4	30x7	I
Transport, 20	1	1395	3¾x5⅛	31x3½	34x4	I
Transport, 30	1½	1995	3¾x5	36x3½	36x5	I
Transport, 50	2½	2785	4¼x5½	36x4	36x7	I
Transport, 70	3½	3885	4½x6	36x5	36x10	I
Traylor, B	1½	2390	3¾x5¼	34x3½	34x5	W
Traylor, C	2	2850	4 x5½	36x4	36x7	W
Traylor, D	3	3300	4¼x5½	36x4	36x8*	W
Traylor, E	4	4450	4½x6	35x5	40x10	W
Traylor, F	5	4700	4½x6	36x6	40x6d	W
Triangle, AA	¾–1	1385	3¼x5	34x4½†	34x4½†	I
Triangle, A	1½	2350	3¾x5¼	34x3½*	34x6*	I
Triangle, C	2	2700	3¾x5¼	36x4*	36x6*	I
Triangle, B	2½	2950	4 x5¾	36x4*	36x7*	I
Triumph, G	1	1995	3⅝x5⅛	34x5†	34x5†	W
Triumph, HC	1½	2550	3¾x5¼	36x3½	36x5	W
Triumph, HB	2	2900	3¾x5¼	36x4	36x7	W
Twin City, B.W.	2	2750	4 x5½	36x4	36x7	I
Twin City, A.W.	3½	4000	4¼x6	36x5	40x5d	W
Twin City, FWDB	3½	4750	5½x6	36x6	36x6	I
Twin City, FWDA	5	5250	5½x6	36x7	36x7	I
Ultimate, A	2	3200	4 x5½	36x3½*	36x6*	W
Ultimate, AJ	2	3250	4¼x5½	35x5†	38x7†	W
Ultimate, B	3	3750	4¼x5½	36x4*	36x4d*	W
Ultimate, BL	3	3850	4¼x5½	36x4*	36x4d*	W
Union, FW	2½	3490	4 x6	36x5*	36x8*	D
Union, HW	4	4485	4½x6	36x6	40x12	D
Union, JW	6	5800	5 x6	36x6	40x14	D
United, A	1½	2445	3¾x5¼	36x3½*	34x5*	I
United, B	2½	3150	4¼x5½	36x4*	36x7*	I
United, C	3½	3975	4¼x5½	36x5	36x5d	I
United, V	5	5000	4½x6	36x6	40x6d	I
U. S., N	1½	1975	3¾x5	36x3½*	36x5*	I
U. S., R	3	3075	4 x5¼	36x4	36x4d	W
U. S., S	4	3875	4½x5½	36x5	36x5d	W
U. S., T	6	4850	4¾x6½	36x6	40x6d	W
Velie, 46	1½	1585	3¾x5	36x3½	36x5	I
Veteran, E**	1–1½	3500	3¾x5¼	35x5†	36x6†	W
Veteran, A**	2–2½	4000	4¼x5½	36x4*	36x7*	W
Veteran, D**	2½–3	4400	4½x5½	36x4*	36x7*	W
Veteran, H**	3½–4	5600	4½x6	36x5	36x5d	W
Vim, 29	½	1050	3½x4½	31x4†	31x4†	W
Vim, 30	½	1175	3½x4½	32x4½	32x4½	W
Vim, 31	1	1975	3¾x5½	35x5†	35x5†	W
Vim, 22	2	3150	3¾x5½	36x4	36x6	W
Vim, 23	3	3950	4½x5½	36x5	36x5d	W
Vulcan, 25	2½	4000	4½x6	36x4	36x8	W
Vulcan, 25P	3	4500	4½x6	36x6	40x8	W
Walker-Johnson, B	2½	3500	4½x5½	36x4	36x8	W
Walter, S	5	5600	4½x6½	36x6	40x6d	W
Ward-LaF., 2B	2½	3590	4⅜x5¾	36x4	36x7	W
Ward-LaF., 4A	3½	4690	4½x6¼	36x5	36x5d	W
Ward-LaF., 5A	5	5590	5 x6¼	36x6	40x6d	W

*2-cyl. †6-cyl. ‡8-cyl. All others, not marked, are 4-cyl. Trac., Tractor. **Canadian made.

Final Drive: W—Worm, I—Internal Gear, C—Chains, D—Double Reduction, B—Bevel, 4—Four-Wheel, E—External Gear. *Tires—optional. †Pneumatic Tires. All others solid. ††Price includes body. §—Price includes several items of equipment

*Nelson Le Moon

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Watson, E	1	$1865	3¾x5½	35x5†	35x5†	W
Watson, N	3½	4250	4½x5½	36x5	36x10	W
Western, W1½	1½	2550	4¼x5¼	36x3½*	36x5*	W
Western, L1½	1½	2550	3¾x5	36x3½*	36x5*	W
Western, W2½	2½	3250	4½x5½	36x4	36x7	W
Western, L2½	2½	3250	4¼x6	36x4	36x7	W
Western, W3½	3½	4250	4½x6	36x5	40x5d	W
White, 15	¾	2100	3¾x5½	34x5†	34x5†	B
White, 20	2	3250	3¾x5½	36x4*	36x7	D
White, 40	3½	4200	3¾x5¾	36x5	40x5d	D
White, 45	5	4500	4¼x5¾	36x6	40x6d	D
White Hick., E	1	2450	3¾x5	34x5†	34x5†	W
White Hick., H	1½	2750	3¾x5	36x3½	36x5	W
White Hick., K	2½	3350	4¼x5¼	36x4	36x5	W
Wichita, K	1	2300	3¾x5¼	36x3*	36x1*	W
Wichita, L	1½	2600	3¾x5¼	36x3½*	36x5*	W
Wichita, M	2	2800	3¾x5¼	36x3½*	36x6*	W
Wichita, R	2½	3000	3¾x5¼	36x4*	36x7*	W
Wichita, RX	2½	3600	4¼x6	36x4*	36x8*	W
Wichita, O	3½	4000	4¼x6	36x5*	36x5d*	W
Wichita, S	5	$5000	4¼x6	36x6	40x6d	W
Wilcox, AA	1	2100	3¾x5½	36x4*	36x4*	W
Wilcox, B	1½	2775	4¼x5	36x4	36x5	W
Wilcox, D	2½	3300	4¼x5	36x4*	36x3½d*	W
Wilcox, E	3½	4250	4½x6	36x5*	36x5d*	W
Wilcox, F	5	5200	4¾x6½	36x5	40x6d	W
Wilson, F	1½	2270	3¼x5	33x3½	33x5	W
Wilson, EA	2½	2325	4¼x5¼	36x4	36x7	W
Wilson, G	3½	3335	4½x5½	36x5	36x5d	W
Wilson, H	5	4520	4¾x6	36x6	40x6d	W
Winther, 751	1	1795	3½x5	34x1¼†	35x5†	I
Winther, 430	1½	2350	3¾x5	32x4	32x4	I
Winther, 39	1½	$2450	3¾x5	34x3½	34x5	I
Winther, 49	2	3250	4 x5	34x4	34x4d	I
Winther, 50	2½	3905	4 x6	38x7†	42x9†	I
Winther, 70	3½	4200	4 x6	36x5	36x5d	I
Winther, 450	2½	3600	4 x5	34x5	36x6	I
Winther, 109	5	5250	4½x6	36x6	40x5d	I
Winther, 140	7	5900	5 x6	36x6	40x7d	I
Wisconsin, B	1	1950	4 x5¾	34x5†	34x5†	W
Wisconsin, C	1½	2500	4⅜x5¾	36x6†	36x6†	W
Wisconsin, D	2½	3500	4½x6¼	36x6	36x10	W
Wisconsin, E	3½	4000	5 x6¼	36x6†	36x12†	W
Witt-Will, N	1½	2750	3¾x5	36x3½*	36x5*	W
Witt-Will, P	2½	3250	4½x5¼	36x3½*	36x7*	W
Wolverine, J	1	2125	3½x5	34x3	34x4	I
Wolverine, J	1½	2375	3¾x5	34x3½	34x5	I
Wolverine, J	2	2640	3¾x5	34x4	34x7	I
Wolverine, J	2½	3425	4½x5¼	36x5	36x10	I
Wolverine, L	3½	4100	4½x5½	36x5	36x10	I
Yellow Cab, M21	¾	2050	3¾x5	32x4	32x4	B
Yellow Cab, M41	1¼	2350	3¾x5	34x4½	34x4½	W

*2-cyl. †6-cyl. ‡8-cyl. All others, not marked, are 4-cyl. Trac., Tractor. **Canadian made.

Final Drive: W—Worm, I—Internal Gear, C—Chains, D—Double Reduction, B—Bevel, 4—Four-Wheel, E—External Gear. *Tires—optional. †Pneumatic Tires. All others solid. ††Price includes body. §—Price includes several items of equipment.

Farm Tractor Specifications and Prices

TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Plow Capacity
All-In One	16-30	$1975	3	Clim.	4-5 x6½	GDK	3-4
Allis-Chalm. B	6-12	925	2	LeR.	4-3½x4½	Gas.	1
Allis-Chal.G.P	6-12	850	2	LeR.	4-3½x4½	Gas.	1-2
Allis-Chalm.	12-20	1495	2	Midw.	4-4½x5½	Gas.	2-3
Allis-Chalm.	18-30	2150	4	Own	4-4¾x6½x	GorK	3-4
Allis-Chalm.	10-18	875	4	Own	4-4¼x6½	G,K	4
Allwork 2-G	14-28	1875	4	Own	4-4¾x6	GorK	3
Allwork C	14-28	1675	4	Own	4-5 x6	GorK	3
AndrewsKin.D	18-36	2500	4	Clim.	4-5 x6½	GorK	4
Appleton	12-20	1500	4	Buda	4-4¼x5½	G,K	2-3
Aro 1921	3-5	550	4	Own	1-4½x5	Gas.	1
Aultman-T.	15-30	2200	4	Clim.	4-5 x6½	G,K	4
Aultman-T.	22-45	3850	4	Own	4-5½x8	G,K	6
Aultman-T.	30-60	5000	4	Own	4-7 x9	G,K,D	8
Automot. B-3	12-24	1785	4	Herc.	4-4 x5	Gas.	2-3
Avery,SR.Cul.	5-10	....	4	Own	4-3 x4	G,K	..
Avery Cult-C	....	....	3	Own	6-3 x4	G,K	..
Avery B	5-10	....	4	Own	4-3 x4	G,K	2
Avery C	....	....	4	Own	6-3 x4	G,K	..
Avery	8-16	....	4	Own	2-5½x6	G,K,D	2-3
Avery	12-20	....	4	Own	4-4¾x6	G,K,D	2-3
Avery	12-25	....	4	Own	2-6½x7	G,K,D	3-4
Avery	14-28	....	4	Own	4-4½x7	G,K,D	3-4
Avery	18-36	....	4	Own	4-5½x6	G,K,D	4-5
Avery	25-50	....	4	Own	4-6½x7	G,K,D	5-6
Avery	45-65	....	4	Own	4-7¾x8	G,K,D	8-10
Bates	15-25	....	4	Own	4-4¼x6	Ker.	3
Bates Mule H	15-25	....	4	Midw	4-4½x5¼	Gas.	3
Bates Mule, F	18-25	....	*2	Midw	4-4½x5¼	Gas.	3
Bates Mule,,G	25-35	....	*2	Midw	4-4½x6	Gas.	com.
Bean	8-16	....	*1	Own	4-3⅞x4	G,K	2-3
Beeman, G	2-4	315	4	Own	1-3½x4½	Gas.	½
Best	30	....	*2	Own	4-4¾x6½	G,K,D	4
Best	60	....	*2	Own	4-6½x8½	G,K,D	8-9
Boring 1921	....	1850	3	Wauk	4-4¾x5¾	GorK	2
Burn-Oil, 1921	15-30	1650	4	Own	2-6¾x7	Ker.	3-4
Capital	15-30	1000	2	Own	4-4¼x6	Gas.	3
Case	10-18	800	4	Own	4-3⅞x5	GorK	2
Case	15-27	1680	4	Own	4-4½x6	GorK	3
Case	22-40	3100	4	Own	4-5½x6¾	GorK	4-5
Caterpillar T11	25	4250	*2	Own	4-4¾x6	Gas.	4
Caterpillar T16	40	6500	*2	Own	4-6½x7	Gas.	6
Centaur	5-2½	455	2	N Way	2-4½x4½	GorK	1-9
Chase	12-25	1725	3	Buda	4-4¼x5½	GorK	2-3
Chicago 40	40	2500	4	Own	4-4½x6	Gas.	4
Cletrac F	9-16	845	*2	Own	4-3¼x4½	G,K,D	2
Cletrac W	12-20	1495	*2	Own	4-4 x5½	G,K,D	2-3
Dakota 4	15-27	1750	3	Dom,	4-4¾x6	Gas.	3
Dart B.J.	15-30	2100	4	Buda	4-4½x6	Gas.	3-4
Depue A	23-30	2500	4	Buda	4-4½x6	Gas.	4
Dill D	20	2480	4	Cont.	4-4½x5½	Gas.	3
Dill R.W.	20	2980	4	Midw.	4-4½x6	Gas.	3
Do-it-All	-7	595	..	Own	1-4½x5	Gas.	..
Eagle F	12-22	1100	4	Own	2-7 x8	GorK	3-4
Eagle F	16-30	1850	4	Own	2-8 x8	GorK	4-5
E-B AA	12-20	1425	4	Own	4-4¾x5	G,K,D	3
E-B Q	12-20	925	4	Own	4-4¾x5	G,K,D	3
E-B	16-32	2000	4	Own	4-5½x7	G,K,D	4
Evans	18-30	2000	4	Buda	4-4½x6	G,K	3
Fageol D	9-12	1525	4	Lyc.	4-3½x5	Gas.	2
Farm Horse B	18-30	1885	4	Clim.	4-5 x6½	G,K	3-4
Farquhar	15-25	....	4	Buda	4-4½x6	G,K,D	3-4
Farquhar	18-35	....	4	Own	4-6 x8	G,K,D	4-5
Farquhar	25-50	....	4	Own	4-7 x8	G,K,D	6-7
Fitch 4	20-35	....	4	Clim.	4-5 x6½	GorK	3-4
Flour City	20-35	....	4	Own	4-5¼x6	Ker.	4-6
Flour City	33-50	....	4	Own	4-6¾x7	Ker.	6-8
Flour City	40-70	....	4	Own	4-7½x9	Ker.	8-1
Fordson	....	625	4	Own	4-4x5	G,K	2
Fox E	20-40	3100	4	Own	4-5½x7½	G or K	4
Franklin G	18-30	4000	*2	Clim.	4-5 x6½	G or K	3-3
Franklin C	18-30	3350	*2	Clim.	4-5 x6½	G or K	3-4
Franklin G2	18-30	4350	2	Clim.	4-5 x6½	G or K	3-4
Frick A	12-20	1200	4	Erd.	4-4 x6	G,K	2-3
Frick C	15-28	1600	4	Beav.	4-4¼x6	G,K	3-4
G-O G	14-28	$1485	4	Wauk.	4-4½x5¾	G or K	3
Grain Belt, A	18-36	2150	4	Wauk.	4-4¾x6¾	G or K	4
Gray 1920	18-36	2000	3	Wauk	4-4¾x6¾	Gas,	4
Ground Hog	19-31	2000	4	Erd.	4-4 x6	G or K	3
Gt. Western St	20-30	1950	4	Beav.	4-4¾x6	K	4
Hart-Parr 20		995	4	Own	2-5¼x6½	K,D.	2
Hart-Parr 30	30	1595	4	Own	2-6½x7	K,D.	3
Heider D	9-16	1170	4	Wauk	4-4¼x5¾	G,K	2
Heider C	12-20	1395	4	Wauk	4-4½x6¾	G,K	3
Heider Cult	6-10	1050	4	LeR.	4-3½x4½	Gas.	1
Hicks	20-30	....	4	....	4-4½x6	K or G	4
Huber Light 4	12-25	1185	4	Wauk	4-4½x5¾	G or K	3
Huber Super 4	15-30	1885	4	Midw.	4-4½x6	Gas	3
Illinois, Super-Drive C	18-36	2375	4	Clim.	4-5 x6½	G,K	4
Imperial E	40-70	5000	4	Own	4-7½x9	G,K,D	10
Indiana F	5-10	895	2	LeR.	4-3½x4½	Gas.	1-2
International	8-16	900	4	Own	4-4¼x5	G,K,D	2
International	15-30	1750	4	Own	-5¼x8	G,K,D	4
J-T N	20-40	3485	*2	Chief.	4-4¾x6	G,K,D	3-4
Klumb F	16-32	1650	4	Clim.	4-5 x6½	....	..
Knudsen 1920	25-45	2500	4	Own	4-5 x9	Gas	4-6
LaCrosse M	6-12	650	4	Own	2-4 x6	G,K	1
LaCrosse G	12-24	985	4	Own	2-6 x7	G or K	3
Lauson	12-25	1495	4	Midw.	4-4½x5¼	Gas.	3
Lauson	15-25	1685	4	Beav.	4-4½x6	G or K	3-4
Lauson 21	15-30	1985	4	Beav.	4-4¾x6	G or K	3-4
Lauson Read	15-30	2225	4	Beav.	4-4¾x6	K	....
Leader B	12-18	1095	4	Own	2-6 x6½	G,K,D	2-3
Leader N	16-32	1985	4	Clim.	4-5 x6½	G,K	3-4
Leader GU	18-35	2775	*2	Clim.	4-5 x6½	G,K	3-4
Leonard E	20-30	2530	4	Buda	4-4½x6	G,K	3
Liberty A	18-32	2475	4	Clim.	4-5 x6½	G,K	4
Linn H1J	40-	4500	*	Cont.	4-4½x5½	Gas	4
Linn W	60	5103	*	Wauk	4-5 x6¼	Gas	6
Little Giant, B	16-22	2200	4	Own	4-4½x5	K	4
Little Giant, A	26-35	3300	4	Own	4-5½x6	K	6
Lombard	35-150	....	*2	....	6-5½x6¾	Gas.	13
Lombard	50	....	*2	....	4-4¾x6¼	....	3-10
Magnet B	14-28	1875	4	Wauk	4-4½x6¼	K&G	3
Master Jr.	5-10	585	..	LeR.	-2½x4	Gas.	1
MerryGar1921	2	230	2	Evin	1-2⅝x2½	Gas.	..
Minne. All-P	12-25	1200	4	Own	4-4½x7	G or K	3
Minne. Gen.P	17-30	1850	4	Own	4-4¾x7	G or K	3-4
Minne. Med.Duty	22-44	3300	4	Own	4-6 x7	G or K	5-6
Minne. HeavyDuty	35-70	4600	4	Own	4-7½x9	G or K	8-9
Mohawk 1921	8-16	785	2	Light	4-3¼x4½	K or G	1-2
Moline Univ D	9-18	990	2	Own	4-3½x5	Gas.	2-3
Moline Orch.	9-18	1075	2	Own	4-3½x5	Gas.	2-3
Motor Macult	1½	195	2	Own	1-2¾x3½	Gas.	..
Motox	15-30	2250	4	Buda	4-4½x6	Gas.	3-4
NB 1	3-6	425	4	Own	2-3¾x4	Gas.	¾
NB 2	3-6	425	4	Own	2-3¾x4	Gas.	¾
Nichols-Shep. 2)-42. 25-50	20-42	3100	4	Own	8 x10	G or K	3-6
Nichols Shep. 25-50	25-50	3460	4	Own	9 x12	G or K	4-7
Nilson Jr. E	15-25	1775	4	Wauk	4-4¼x5¾	G or K	3
Nilson Senior.	20-40	2475	5	Wauk	4-5 x6½	G,K	4
Oil Pull K	12-20	1485	4	Own	2-6 x8	K,D	3
Oil Pull H	16-30	2285	4	Own	2-7 x8½	K,D	4
Oil Pull G	20-40	3175	4	Own	2-8 x10	K,D	5-6
Oil Pull E	30-60	4590	4	Own	2-10x12	K,D	8-10
Oldsmar GarK	2½-5	395	4	Own	1-5½x5½	Gas.	2½
Oliver A	15-30	....	*2	Beav.	4-4½x6	G or K	3-4
Once Over Tiller Mark 6	12-25	3000	4	Strns	4-4½x6	Gas.	2
Parrett K	15-30	1950	4	Pitt	4-4½x6	G,K	3
Peoria L	12-25	1785	4	Clim.	4-5 x6½	G,K	3
Pioneer G	18-36	....	4	Own	4-5½x6	G,K,D	4
Pioneer C	30-60	....	4	Own	4-7 x8	Gas.	10
Planet Jr.	5-10	950	2	LeRoi	4-3½x4½	Gas.	1
Plowman A	15-30	1995	4	Buda	4-4½x6	G,K	3-4
Port Huron A	12-25	$1700	4	Chief	4-3¾x6	G,K	3
Prairie Dog, L	9-18	650	3	Wauk	4-3¾x5½	Gas.	2
Prairie Dog D	15-30	1250	4	Wauk	4-4½x6¼	Gas.	3
Ranger Cul. T-20	8-16	....	4	LeR.	4-3½x4½	Gas.	1
Reed A	15-30	1985	4	Wauk	4-4¼x6½	G or K	3-4
Reed A-1	18-36	2185	4	Wauk	4-5 x6¼	Gas.	4
Reliable	10-20	885	4	Own	2-6 x7	Ker.	2
Rex	12-25	1600	4	Wauk	4-4¼x5¾	G or K	3
Russell	12-24	1500	4	Own	4-4¼x5¾	G or K	2-3
Russell	15-30	2200	4	Own	4-5 x6½	G or K	3-4
Russell	20-35	3000	4	Own	4-5½x7	G or K	4-5
Russell	30-60	5000	4	Own	4-8 x10	G or K	8-10
Samson M	..	....	4	Nor	4-4 x5½	G,K	2
Sandusky, J	10-20	1259	4	Own	4-4¼x5½	G,K,D	2
Sandusky E	15-35	1750	4	Own	4-5 x6½	G,K,D	4
Shawnee Com.	6-12	....	2	LeR.	4-3½x4½	Gas.	10
Shawnee Com.	9-18	....	2	Gray	4-3½x5	....	..
Shelby D	15-30	....	4	Beav.	4-4¾x6	G,K	3
Shelby C	10-20	....	4	Erd.	4-4 x6	G or K	2-3
Short Turn	20-40	1500	3	Beav.	4-4¾x6	G,K	3
Square T A	18-35	2075	3	Clim.	4-5 x6½	K,G	3
Steady Pull	12-24	1485	4	....	4-4 x5	Gas.	3
Stinson 4E	18-36	1835	4	Beav.	4-4¾x6	G,K	4
Stone	20-40	2250	4	Beav.	4-4¾x6	G,K	4
Tioga 3	15-27	2625	4	Wisc.	4-4½x6	Gas.	3-4
Titan	10-20	900	4	Own	2-6½x8	G,K,D	3
Topp B	30-45	3500	4	Wauk	4-4¾x6¾	Gas.	3-4
Toro Cultivator	6-10	....	3	LeR	4-3½x4½	Gas.	2
Townsend	10-20	895	2	Own	4-6½x7	Ker.	2-3
Townsend	15-30	1485	2	Own	4-7 x8	Ker.	3-4
Townsend	25-50	2750	2	Own	4-8½x10	Ker.	4-8
Traction Motor	40-50	....	4	....	8-3½x5	Gas.	4-5
Traylor TB	6-12	715	4	LeR.	4-3½x4½	Gas.	1-2
Triumph H	18-36	2450	2	Erd.	4-4¾x6	Ker.	4
Trundaar 10	25-40	3750	*2	Wauk	4-5 x6¼	G or K	4
Turner 1921	14-25	1295	4	Buda	4-4½x5½	G,K	3
Twin City	12-20	1580	4	Own	4-4¼x6	G,K	3
Twin City	20-35	3175	4	Own	4-5½x6¾	G,K	5
Twin City	40-65	5250	4	Own	4-7¾x9	G,K	8
Uncle Sam C20	12-20	1385	4	Weid.	4-4 x5½	G	2-3
Uncle Sam B19	20-30	2300	4	Beav.	4-4¾x6	G or K	3-4
Uncle Sam D21	20-30	1985	4	Beav.	4-4¾x6	G or K	3-4
Universal	1-4	475	2	Own	1-3½x5	G	1
Utilitor 501	2½-4	380	4	Own	1-3½x4½	G	1
Velie Biltwell	12-22	1750	4	Own	4-4½x5½	G,K,D	3
Victory 1921	9-18	1350	4	Gray	4-3½x5	Gas.	2
Victory 1921	15-30	1750	4	Wauk	4-4¼x5¾	Gas.	3
Vim B	15-30	1650	4	Wauk	4-4¾x5¾	G,K	3
Wallis K	15-25	1600	4	Own	4-4¼x5¾	G,K	3
Waterloo N	12-25	1450	4	Own	2-6½x7	G,K	3
Webfoot 53	28-53	5000	*2	Wisc.	4-5¾x7	G,D	6
Wellington B	12-22	....	4	Erd	4-4 x6	Ker.	2-3
Wellington F	16-30	....	4	Chief	4-4¾x6	Ker.	3-4
Western, 1920	16-32	2100	4	Clim.	4-5 x6½	Gas.	4
Wetmore	12-25	1650	4	Wauk	4-4 x5¾	G,K	3
Wharton E	12-20	1800	3	Buda	4-4½x5½	Gas.	2
Whitney	9-18	....	4	Own	2-5½x6½	Gas.	2
Wichita T	15-30	2000	4	Beav.	4-4½x6	G,K,D	3-4
Wisconsin E	16-30	2250	4	Clim.	4-5 x6½	G or K	3
Wisconsin F	20-40	2450	4	Wauk	4-5 x6¼	G or K	4
Wisconsin, H	22-40	2800	4	Clim.	4-5½x7	G or K	4-6
Yuba 12-20	12-20	2470	*2	Wisc.	4-4½x6¾	G,K,D	3
Yuba 15-25	15-25	2945	*2	Wisc.	4-4¼x6	G,K,D	..
Yuba 20-35	20-35	3975	*2	Wisc.	4-5½x7	G,K,D	4
Yuba 25-40	25-40	4417	*2	Wisc.	4-5¾x7	G,K,D	..
Zelle	12-25	....	4	....	4-4½x5½	G or K	3

ABBREVIATIONS: G—Gasoline. K—Kerosene. D—Distillate. Plow capacity varies in relation to operating conditions. Figures are based on 14 in. plows. Engine Make: Beav.—Beaver. Clim.—Climax. Cont.—Continental. Dom.—Domas. Evin.—Evinrude. Herc.—Hercules. LeR.—LeRoy. Midw.—Midwest. Nway.—New Way. Nor.—Northway. Strns.—Stearns. T.C.—Twin City. Wauk.—Waukesha. Weid.—Weidely. Wis—. Wisconsin. *—Crawler type. All others are wheel type.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Memphis	Tri-State Fair Automobile Show	Sept. 24-Oct. 1
Waterloo	Automobile Show	Sept. 26-Oct. 2
New York	Electrical Exposition	Sept. 28-Oct. 8
Peoria, Ill.	National Implement and Vehicle Show	Sept. 30-Oct. 8
Cincinnati	Fall Automobile Show	Oct. 1-8
Flushing, N. Y.	Queen's County Automobile Srow	Oct. 10-15
Oakland, Calif.	International Traffic Officers' Ass'n	Oct. 24-29
Omaha	International Automobile Congress	Nov. 3-5
Little Rock, Ark.	Little Rock Automobile Dealers' Assn	Nov. 11-19
Jersey City	Second Annual Show	Nov. 14-19
Chicago	Automobile Equipment Show	Nov. 14-19
New York	Automobile Salon	Nov. 27-Dec. 3
Chicago	Automobile Salon	Jan. 28-Feb. 3
New York	National Automobile Show	Jan. 7-13
Cleveland	Cleveland Automobile Manufacturers' and Dealers' Assn.	Jan. 14-21
Buffalo	Buffalo Automobile Dealers' Assn	Jan. 14-21
Chicago	American Road Builders' Convention and Good Roads Show	Jan. 17, 18, 19 and 20
Chicago	National Automobile Show	Jan. 28-Feb. 3
Minneapolis	Tractor Show	Jan. 30-Feb. 4, inclusive
Winnipeg, Canada	Canadian Automotive Equipment Ass'n Show	Feb. 6-11
Kansas City	Kansas City Motor Car Dealers' Assn	Feb. 9-16
Louisville, Ky.	Louisville Automobile Show	Feb. 20-25
Des Moines	Winter Automobile Show	Feb. 26-March 3
Brooklyn	Eleventh Annual Brooklyn Motor Vehicle Dealers' Assn.	March 4-11
Newark, N. J.	Newark Automobile Dealers' Assn	March 11-18

RACES

Fresno, Calif.	San Joaquin Race	Oct. 1
Los Angeles	Speedway Race	Nov. 24

FOREIGN SHOWS

Berlin	Automobile Salon	Sept. 23-Oct. 2
Paris, France	Paris Motor Show	Oct. 5-16
Olympia, England	Automobile Show	Nov. 3-12
London	British Motor Show, Motor Mfgs. and Traders	Nov. 4-11
Paris	Aviation Exhibition	Nov. 12-27
Santiago, Cuba	Annual Automobile Show	March, 1922
Rio de Janeiro, Brazil	Automotive Exhibition	September, 1922

CONVENTIONS

Salt Lake City	Intermountain Automotive Trades Assn	Oct. 8
Chicago	Twenty-eighth Annual Convention National Implement & Vehicle Association	Oct. 12-14
Cleveland	National Tire Dealers' Association	November
New York	Service Managers Convention	Nov. 15-16
Columbus, O.	Ohio Automobile Trade Ass'n Meeting	Dec. 12, 13, 14

Indianapolis Dealers Lend Aid in Safety Week Drive

Indianapolis, Sept. 14—The Board of Public Safety has set aside next week as "Walk right, drive right week," and has arranged for a detail of 10 policemen to spend the week inspecting brakes, signals and registration cards on automobiles using the city streets. The Hoosier State Automobile Assn., the Indiana Automotive Trade Assn. and the Indianapolis Chamber of Commerce have informed the board that they will cooperate in the effort to eliminate accident causes.

The 10 policemen will be stationed in several streets to stop motorists and put them through tests which have been prescribed by Chester S. Ricker, Indiana representative of the American Automobile Assn. After motorists have passed the tests and received instructions for necessary repairs, posters stating that these cars have been inspected will be placed on the windshields, and on the side facing the driver will be posted essential rules for motorists.

"ENCLOSED CAR WEEK" DATES

"Enclosed Car Week" shows will be held:

Brooklyn	Oct. 24-29
Kansas City	Oct. 8-15
Detroit	Oct. 8-15
Cleveland	Oct. 15-22
Syracuse	Oct. 15-22
Buffalo	Oct. 15-18
Rochester	Oct. 24-29
Washington, D. C.	Nov. 14-19

RECEIVER FOR HINKLEY MOTORS

Detroit, Sept. 26—An involuntary petition in bankruptcy has been filed by creditors against the Hinkley Motors Corp., and the Security Trust Co. has been appointed receiver. Acts of bankruptcy are alleged in the complaint of several creditors' claims, while insolvent. The liabilities are said to total approximately $1,500,000, while the fixed assets amount to less than $1,000,000. The company has many unfilled orders on its books.

COATS PLANS $1,000 STEAMER

Indianapolis, Sept. 24—It has been announced here that the Coats Steamer Automobile Co., recently incorporated in Delaware for $5,000,000, has been completely organized and is looking for a suitable factory site in Indiana. It is said that the company has in mind the manufacture of a car not to exceed $1,000 in price. George G. Rowland, head of the Rowland Powers Consolidated Collieries of Terre Haute, is president. G. A. Coats of this city is sales manager of the company.

BREAKS THREE RECORDS

Syracuse, N. Y., Sept. 24—The National Motorocycle Championship races here Sept. 19 gave new world's records over dirt tracks for the 1, 5 and 10-mile distances. All three records went to Fred Ludlow of the Harley-Davidson team. His time for 10 miles was 7:38.80, against the old record of 7:39.40. Ludlow's time for the mile was 44.05 seconds, against the old mark of 45.40, and for five miles, 3:45.74, against 3:50.80, the old record.

REDUCES TAXI RATES

Chicago, Sept. 24—The Yellow Cab Co. of this city has made an additional reduction of 5 cents for the first half mile—from 25 to 20 cents. This is the third reduction in taxi rates of this company within the last seven months and is made possible because of the large increase in business. The company claims that the cut represents a shrinkage in its income of $500,000 a year, basing a 5-cent loss on each trip made by its 3000 drivers.

YOUR customers buy service, not grease. So wipe off the steering wheel rim when you're through with the job.